PRODUCTION IN INDIA

A COMPARATIVE STUDY IN NATIONAL PRODUCTIVITY

BY

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TO

REVATI MOHAN DAS, ESQ.
A friend and patron since
my school days
at Dacca.

PREFACE.

"Production in India" is a comparative study in national productivity with special reference to the prosperity or material welfare of the people. The object of the treatise is twofold: First, to help in building up the objective background of India's thinking on the question of national wealth. Second, to find out the fundamental cause of India's extreme poverty, which is an outstanding phenomenon in the modern economic world.

The treatise was begun in 1912 as a part of the report on Indian agriculture to the seminar on agricultural economics in the University of Wisconsin. In 1917, the work was resumed in its present form, but had to be given up for lack of time and means. The subject of productivity as a part of India's poverty problem had, however, occupied the mind of the author for a much longer period and it was the study of agricultural production which led him to the conclusion that national prosperity depended more upon the industrial efficiency of the people than the natural resources of the country. While this conclusion made him take up the study of the human element in production, i.e., the labor question, he had also intended to make a comparative study of national productivity with a view to determining the industrial efficiency of India.

A word may be said regarding methodology. Any treatise on production must give due consideration to the factors, namely, land, labor and capital. The amount of capital or capital goods is rather insignificant in India and it has received only a fair consideration. Land more readily lends itself to description and comparison than labor. Moreover, the latter forms the subject matter of the author's other treatises. Much more space has therefore been given to the discussion of land in the present volume.

In the study of historical growth of productivity, the year 1890-91 has, as a rule, been taken as the starting point. The statistics for previous years are neither complete nor reliable for comparative purposes. In only a few cases, has it been possible to trace back the data beyond that year.

No attempt has been made to translate the French or international measures and weights into their English or Indian equivalents. They have been mostly used in comparison and their equivalents have been given in foot-notes. Except where otherwise noted, the documents and works on which this treatise is based are given in the bibliography. The reason for omitting some of the references is that they can be easily located in the current statistical abstracts, yearbooks and almanacs. It has not been found possible to illustrate some of the statistical tables with charts and diagrams in this edition.

In presenting the treatise to the public, the author is fully conscious that it is far from being exhaustive or even complete. There are several reasons for this defect, such as lack of time and means on the part of the author, incompleteness of the data, both Indian and foreign, for comparative purposes and meagreness of statistics on production in India The time has not yet come, especially in India for treating such a subject with any pretence to adequacy The present volume is only an attempt to outline what seems to the author to be the main phases of the productive system which determines industrial efficiency and affects national prosperity

In conclusion, the author takes this opportunity to express his thanks to the Bibliotheque de la Direction de la Statisque Generale de la France in Paris, where practically all the work was done, and the Commercial Library in Calcutta, where some of the old Indian statistics were consulted, for the help they have kindly rendered in the preparation of this volume

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RAJANI KANTA DAS.

CHAPTER I.

INTRODUCTION.

The wealth of a nation depends upon its productive power. Land, labor and capital are the essential factors of production, but the parts played by them are not of equal importance.

Capital is the instrument with which labor utilises land for productive purposes. The importance of capital in the modern industrial organisation cannot be minimised Industrial evolution might be said to be synonymous with the accumulation of social capital. Capital is, however, a passive factor. Its growth is determined by the habit of thrift and foresight in saving for future production. Given a certain amount of capital to begin with, efficient labor with sufficient land can easily build up an adequate amount of social capital in a comparatively short time.

Land supplies the material basis to which immaterial mind in the form of labor can be applied for the production of wealth. Labor and capital being the same, production varies directly with the supply of land. This is the advantage which the younger nations like America have over the older ones. But population tends to reach the maximum limit of resources as determined by the known arts of production and, sooner or later, the growth of production is determined by the efficiency of labor in inventing new industrial arts Like capital, land is also a passive factor. Theoretically, land is limited in quantity, but practically, it lends itself to a great deal of flexibility. Land is almost the same to-day as ages ago, but the development in the art of production has increased, both in kind and quantity, the resources or those objects of nature which have been proved to be of value for productive pusposes The same Mississippi Valley which could not yield sufficient food to a few thousand Indians two centuries ago, is supplying the needs of millions of a highly civilised people to-day

Labor is the creative principle in the productive process. It is labor which conquers nature, discovers laws, invents machinery, devices art, co-ordinates land and capital and organises industrial systems. Labor is the dynamic factor and is ever unfolding itself in both intensity and extensity. It now produces a thing in a day which formerly took a year to finish and makes the wastage of yesterday the resources of to day. The growth of its efficiency is the most important cause of increase in productivity.

There are several ways of estimating the productivity or productive power of a nation. First, by the ratio between the actual and potential production, by the latter is meant the produce which would result from industry by the application of the most efficient labor and capital to the known resources of the country. This is not, however, a practicable method for the estimation of national productivity. Second, by the growth, both in quantity and quality, of products in proportion to the increase in resources. Third, by relative prosperity, i. e., by comparing the per capita wealth of one country with that of others. Since prosperity is the object of all production, this is one of the best methods of estimating national productivity.

What prosperity consists of is, however, hard to define. It must include all the necessaries for the maintenance of life and all the requirements for the development of individuality and for the preservation of the social standard. But habit and custom play such an important part upon consumption that it is often impossible to draw a sharp line between necessaries and luxuries. Requirements also offer a very wide range of variation according to time and place as well as individual aims and social attitudes. Moreover, mere conformity to the standard of a social class, such as the wage-earners, does not necessarily mean prosperity.

What is true of an individual is also more or less true of a nation. A prosperous nation must provide for its citizens all the necessaries and requirements and preserve national prestige or international standard. The necessaries of life, of course, vary according to climate, but since they form a more or less subordinate part of the manifold needs of modern civilised life, they may be ignored for practical purposes. The stages of social development also bring about some variation in national requirements. Although facilities for communication give rise to the same ideals and aspirations, especially among the peoples of advanced countries, there still remains a difference in the requirements of various nations.

Unlike poverty, prosperity is, moreover, a relative term. Partly due to inadequate production, but mostly to unequal distribution, the real income of individuals or classes may fall far short of the provision for necessaries. Absolute poverty is thus still one of the evils of the day. But absolute prosperity in the sense of sufficiency above requirements is scarcely possible in modern times. There is no end to human wants and the thought of providing for posterity, desire for “conspicuous consumption” and love of power and glory always make a man acquire more. Besides, in the present dynamic society, where aims and aspirations follow one another in quick succession giving rise to ever-increasing wants, it is hard to determine where poverty ends, and prosperity begins. Even a Rockefeller, determined to eradicate hookworms from the earth, or a Carnegie, anxious to provide every township with a library, finds his "wants" unsatisfied for lack of "funds". Prosperity cannot, therefore, be judged from a subjective viewpoint; nor is it possible to have a clear conception of it without comparison.

Relative prosperity may be studied either with reference to the whole world or to advanced countries. In the former case, India having 17 per cent of the world's population must have the same proportion of its wealth. But such a procedure is both impractical and useless. For, there does not exist any estimate of the world's wealth nor would its average amount mean prosperity to progressive nations. A more appropriate method of judging relative prosperity would be to take into consideration such advanced countries as the United States, Great Britain, France, Germany, Italy, Japan and Belgium, which through intellectual achievement, material progress or capitalistic imperialism control the destiny of other nations and influence the direction of social evolution

The productivity of a nation may be determined by its wealth or income, which is generally estimated in terms of money—the common denominator for measuring all forms of wealth. But for comparative purposes, the exchange value, on which such estimate is generally made, is rather defective. National wealth thus estimated excludes many commodities which have no exchange value, such as national buildings, public parks and household work, and which are more or less variable items in different countries. Moreover, there is no uniform rate in international exchange except for a very few standard commodities. National productivity may also be computed with reference to the products of various industries, such as wheat, cotton, cattle, timber and iron and steel. The defect of such a system is obvious. It neglects the quality and leaves out many minor and unstandardised commodities. But although somewhat inaccurate and incomplete, it is a clearer and more concrete method and offers opportunity for the study of the products of principal industries, which contribute the largest share to national wealth.

How the productivity of India has grown within recent years and how it compares at present with that of other countries and affects the prosperity of the people, form the subject-matter of this study.

CHAPTER II.

RESOURCES

I The Land.

India is separated from the rest of the world by two great natural barriers, namely, the Himalaya ranges and the Indian Ocean. There are three natural divisions, the Himalayas, the Indo-Gangetic Valley and the Deccan. The Himalayas extend over a distance of 1,500 miles from east to west and contains some of the highest peaks of the world. The Indo-Gangetic Valley is a vast plain and is, in most parts, well-watered by the tributaries of the Ganges, Brahmaputra and Indus The Gangetic basin is one of the most fertile and densely populated regions on earth. The Deccan is an extensive tableland, surrounded almost on three sides by the Eastern and Western Ghats and is much variegated in topography.

Both the geographical situation and physical features make the meteorological condition of India extremely diversified While most of the plains have tropical and sub-tropical climates, there also prevails the arctic climate in higher altitudes The most important factor in the meteorology of India is the monsoon which divides the climate into two well-defined seasons, namely, the dry and the wet. The lowest temperature in the plains has been recorded to be 23.2 degrees at Rawalpindi and the highest, 126 degrees in Upper Sind, the normal temperature lying between these two extremes. The annual rainfall also varies from 460 inches at Cherrapunji in the Assam Hills to less than 3 inches in Upper Sind, but the average rainfall in the year amounts to 45 inches.

The flora of India are much more varied than those of any other country in the Estern Hemisphere. This is due to several reasons. First, the country rises from the level of the sea to the height above vegetation. Second, the temperature ranges between tropical heat and arctic cold. Third, precipitation varies from almost absolute aridity to maximum humidity. Thus it has been possible for many plants from widely different neighbouring countries to migrate and thrive in India, notably the Chinese and Malayan plants on the east and south, the Oriental, European and African on the west and the Tibetan and Siberian on the north. For example, about 570 European genera and 760 species are indigenous to India. There are as many Oriental and other genera and species. It has been estimated that there are 4749 woody plants in India consisting of 2,513 trees, 1,429 shrubs and 807 climbers.

The fauna of India are as abundant and varied as her flora. Local richness and climatic difference have made the number and kind of animals inhabiting India very large, and they far surpass those found in the whole of Europe. While there does not yet exist any estimate as to the number of invertibrates that of vertibrates has been estimated to be 1229 genera and 4100 species.

Physical vastness, geographical isolation, topographical variation and climatic fluctuation have great influence upon the industrial development of India. They have made the economic life rich, although self-sufficing. What is more important, they offer opportunities for the fullest utilisation of her immense mineral, vegetable and animal resources and indicate the possibility of her industrial greatness and national prosperity

2. The Area.

The total area of India is, 1,802,624 square miles with a population of 319 millions according to the census of 1921. In area and population, India stands very high among the largest countries of the world, as shown in the following tables :

TABLE—1.

Area and Population in Some Large Countries.

Country.	Date.	Area.	Population.
		(Million sqr. miles.)	(Millions)
Soviet Union (1)	1920	8.1	131.5
Chinese Empire (2)	1912	4.2	318.6
Canada	1920	3.7	8.7
Brazil	1920	3.2	30.6
United States	1920	3.0	105.7
Australia	1920	2.9	5.4
India (3)	1921	1.8	318.9

In the above table, it is seen that the Soviet Union stands at the head of the largest countries of the world with an area of 8.I million square miles. This union is a political federation rather than a national whole But even Siberia, one of its component parts, has an area of 4.8 million square miles and is the largest single tract of land. But most part of it is unproductive and un-inhabitable, and so are parts of Canada, Brazil and Australia, which countries stand respectively third, fourth and sixth in the list. India is seventh in area among the largest countries.

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(1) Soviet Union includes European Russia with an area of 1.48 million square miles and 93.38 million population and Siberia with an area of 4.8 million square miles and [illegible] 06 million population.

(2) China proper has an area of 1.5 square miles and a population of 302·1 millions.

(3) India includes Burma and Beluchistan

From the viewpoint of population, however, India leads other countries with 318.9 million inhabitants and is closely followed by China with 318.6 million inhabitants. The United States is fifth among the countries in area and fourth in population. Of 57·2 square miles of the world's area, India occupies 1·8 million square miles or 3.3 per cent, and of 1849.5 millions of the world's population, India contains 318·9 millions or 17 per cent, according to the census of 1921. In other words, 17 per cent of the world's population is living in 3.3 per cent of its area in India.

Politically India falls under two great divisions · First ,that which is directly under British rule and is called British Provinces. Second, that which is under the rule of the native princes and is called Indian States Some of the Indian States are within the political jurisdiction of Local British Governments and Administrations, while other states have direct relations with the British Government of India. During the past fifty years, there have been great variations in the area and population of India, as shown in the table below

Out of the total area of 1,805,000 square miles in 1921, 1,094,000 square miles or 60 per cent belonged to British Provinces and 711,000 square miles or 40 per cent to Indian States and out of the total population of 318.9 millions, 247 millions or 77.5 per cent were living in British Provinces and 71.94 millions or 22.5 per cent in Indian States. In other words, 77.5 per cent of the population were living in 60 per cent of the land in British Provinces and 22.5 per cent of the population in 40 per cent of the land in Indian States.

The most important question in connection with the area of a country is not so much the actual amount of land as the supply of it in proportion to the population, which is best shown by the density or the number of population per unit of land. Like area and population, the density has also undergone variation both in British Provinces and Indian States during the last 50 years, as shown below

TABLE—3.

Variation in Population per Square Mile in India, 1871-1921. (1)

Year	British Provinces	Indian States	All India
1871	210	-----	——
1881	228.9	108.1	184.3
1891	229	111	184
1901	211	189	167
1911	223	100	175
1921	225	101	177

The above table shows that during the period under consideration the density of population in India rose from 210 in 1871 to 228.9 in 1891, and after remaining practically stationary for a decade, declined to 211 in 1901, to rise again to 225 in 1921. The density of population in Indian States declined from 108·4 in 1881 to 101 in 1921, though there were some rapid fluctuations in the intervening periods. Taking India as a whole, the density of population after remaining practically stationary from 1881 to 1891, declined to 167 in 1901, but rose again to 177 in 1921. The fluctuations in density are partly due to the annexation of new territories from time to time and partly due to the correction of the data through the subsequent census. Since the country has become practically settled as far as the frontier is concerned, it may be concluded that India is becoming more and more thickly populated and the supply of land is diminishing.

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(1) Statistical Abstract re-British India and Statesman's Year-books for years indicated

In spite of the increasing population, India is not yet as densely populated as some of the countries in Western Europe or even as Japan. The density of population in India as compared with that in countries with a population of above 100 persons per square mile is shown in the table below. It is seen that the density varies from 108 per square mile in Spain to 636 per square mile in Belgium. India stands tenth in the list of the countries mentioned above and had a density of 177 persons per square mile in 1921. The people of India are better supplied with land than those of Japan, where there are 295 persons to the square mile.

TABLE—4.

Density of Population in Chief Countries.

Country.	Area in 1000 square miles.	Population in millions.	Population per square mile.
Belgium.	11.7	7.4	636
Holland.	12.5	6.8	546
United Kingdom.	121.6	47.3	388
Italy	117.9	38.8	340
Japan	260.7	77.0	295
Germany	185.8	59.8	239
Hungary	35.6	7.9	220
Austria	32.3	6.4	199
France	212.5	39.4	185
India	1,805.0	318.9	177
Spain	191.7	21.3	108.8

In connection with the density of population, there are several essential points which must be borne in mind. First, some of the thickly populated countries such as Belgium, Holland and England, have colonies and dependencies, the resources of which augment the national wealth. Second, in these days of exchange economy, it is not mere density of population, but the state of industrial development and industrial efficiency which determine the prosperity of a people.

More important than the density of population, or mere land area per person, is the amount of land available for productive purposes. Of the total acreage of 1,152,000,000 in all India, about 659,000,000 acres belong to British Provinces and

496,000,000 acres to Indian States. Of British Provinces, there are returns for agricultural statistics only for 621,000,000 acres according to the professional survey or 618,000,000 acres according to the "village papers," i.e., papers prepared by the village accountants for the assessment and collection of land revenue, Agricultural statistics are based on the figures given by village papers. Of Indian States, statistics are available only for 132,700,000 acres according to the professional survey and 132,900,00 acres according to the village papers. The statistics for Indian States are defective for two reasons : First, additions have been made from time to time to the number of reporting States. Second, only a small number of States submit returns of agricultural statistics. In most of the comparative statements, Indian States have, therefore, been omitted, the statistics of British Provinces only being taken into consideration.

The amount and distribution of productive land in proportion to the unproductive both in British Provinces and Indian States is shown below. It is seen that of the total acreage of 751,402,000 according to the village returns of 1920-21, 165,316,000 acres, or 22 per cent, are not available for cultivation or forestry. A large part of it is hilly and deserty, and the rest is covered with buildings, roads and water and is, therefore, productive in the economic sense of the word, but unproductive in the ordinary of technical sense. 586,087,000 acres of land are suitable for farming and forestry. In short, about four-fifths of the area, for which statistics are available, are productive(1) in India.

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1 The word "productive" has been used to bring under one category arable and forest land and for purposes of comparison with similar land in foreign countries

TABLE—5.

Proportion of Productive Land to the unproductive in India, 1920-21.

CLASSES OF LAND.	BRITISH PROVINCES		INDIAN STATES		ALL INDIA.	
	Area (1000 acres)	Per cent.	Area (1000 Acres)	per cent	Area (1000 acres)	Per cent.
Land not available for farming and forestry ...	141,565	22.9	23,811	17.9	165,316	22
Culturable land and forests ..	476,699	77.1	109,388	2 1	586,087	78
Total ...	618,298	100	133,199	100	751,403	100

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2 Adapted Agricultural Statistics of India Calcutta, 1922 Vol I p [illegible] and Vol II p [illegible]

Like the total area, the productive area has also undergone some variation. The earliest records available for productive area in British Provinces are those of 1878-79. Out of the total acreage of 513,271,000 excluding that of Bengal for which no data are available, 279,582,000 acres were productive during that period. This area increased to 416,699,000 acres in 1920-21, as shown in the table below. The increase in productive area is due to the same reasons as those in the case of the total area

Table—6.

Growth in Acreage of Productive Land in British Provinces. (1000 acres)

Year	Total area according to survey or village papers	Area not available for farming and forestry	Productive area
1878-79	513,271	233,689	279,582[3]
1890-91	436,671	114,729	321,942
1900-01	548,739	138,489	410,250
1910-11	618,581	149,994	468,587
1920-21	618,204	141,505	476,699

The following table shows the proportion of productive area to the unproductiue in various countries. Although some of the figures relate to pre-war period, yet they do not fail to give some rough idea of the subject. It is seen that the productive area varies from 6.7 per cent in the case of Australia to 96.2 per cent in the case of Hungary.

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(1) Excluding Bengal for which no statistics are available Statistical Abstracts re-British India, London, 1881, p 173.

(2) The discrepancies between these and the figures for 1890-91 are due to different sources of statistics

(3) Adapted 640 acres to a square mile

(4) Statistical Abstracts for British India, London, 1892, p 144

(5) Agricultural Statistics of India, Calcutta, 1921, Vol I p 2—3,

TABLE—7.

Proportion of Productive Area to the Unproductive in Various Countries (1).

(1000 hectars) (2)

Country	Year	Total Area.	Unproductive Area		Productive Area	
			Amount	p. c. of Total.	Amount	p. c. of Total.
Hungary	1910	32,486	1,233	3.8	31,253	96.2
Germany	1913	54,110	3,093	5.7	51,017	94.3
Austria	1911	30,000	1,697	5.7	28,304	94.3
Italy	1916	30,9[illegible]0	2,263	7.9	26,393	92.2
France	1916	50,452	4,987	9.4	47,965	90.6
Belgium	1916	2,945	360	12.2	2,585	87.8
New Zealand	1918	26,827	3,737	13.9	23,093	86.1
United Kingdom	1917	52,953	4,613	14.9	26,377	85.1
Japan	1917	38,242	8,185	21.4	30,057	78.6
India (British)	1917	249,754	57,781	23.1	191,973	76.9
Argentine	1910	295,255	77,608	26.3	217,647	73.7
Russia (European, 63 Governments only)	1911	517,284	234,448	45.3	282,842	54.7
Australia	1917	770,402	719,041	93.3	51,360	6.7

(1) Adapted Annuaire Internationale de Statistics Agricole Rome, 1920, p 15

(2) One hectar is equal to 2 471 acres.

(3) Including unknown territories

In connection with the proportion of productive area to the unproductive in each country, two things must be remembered : First, large areas of land in several countries remain still unexplored. Nine-tenths of land in Australia, for instance, are still unknown as far as their productivity is concerned. Second, population varies in different countries. In spite of the fact that only less than half the area of the United States is productive, the land area is so vast in comparison with the population that it has a much larger area of productive land per capita than most of these countries. On the other hand, over three-fourths of the land in India are productive, but the per capita area is very meagre.

3 Arable Land.

The most important natural resources of a country are its arable land, upon which depends the supply of both food and raw materials. This is specially so in the case of India, where the population is very large and the question of food is the vital issue with the majority of the people.

There has been a slight increase in the area of arable land in British Provinces, for which alone early reliable statistics are available, as shown in the table below. The area was estimated at 227,027,000 acres in 1884-85. Taking the figures for 1890-91, which are more reliable, as the basis of calculation, it is seen that the area rose from 321,135,000 acres in 1890-91 to 388,854,000 acres in 1920-21, showing an increase of 20 per cent in 30 years.

TABLE—8.

Growth in the Acreage of Arable Land in British Provinces (1)

Year	Acreage	Per cent of increase as compared with 1890-91
1884-85	227,021,000	...
1890-91	321,135,000	..
1900-01	344,855,000	7
1910-11	385,110,000	19
1920-21	388,154,000	20

In 1920-21, there were also 91,819,000 acres of arable land in Indian States, thus making the total arable land for all India 480,273,000 acres. This means an average of 1,5 acre of arable land per inhabitant. For a population depending mainly upon agriculture, this supply of arable land is very meagre —a fact which becomes clearer when compared with that in other chief agricultural countries, as shown below. It is seen that Argentine, Canada, United States and Australia have each a per capita acreage varying from 6.8 to 3.1. In 1911, there was a per capita acreage of 1.7 in the Russian Empire as against 1.5 in India. On the other hand, France—an industrially developed country—has an acreage of 1.4 per inhabitant. The United States, which is one of the leading manufacturing countries, has more than twice as much acreage as India. The arable land in the rest of the countries varies from ·9 acre per head in the case of Italy to .3 acre in the case of Great Britain and Japan.

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(1) *Vide Supra*, p 16.

TABLE 9.

Supply of Arable Land per head in Chief Countries (1)

Country	Year	Total Arable Land (1000 acres)	Per Capita Arable Land (acre)
Argentine	1917-18	59,167	6.8
Canada	1911	48,319	6·0
United States	1919	348,552	3·3
Australia	1920	16 809	3·1
Russia (European)	1911	278,615	1·7
India	1920	479,131	1·5
France	1919	54,405	1 4
Italy	1911	31,789	.9
Germany	1921	49,566	·8
Austria	1920	4,182	·6
Belgium	1920	2,990	·4
Great Britain	1920	15,352	·3
Japan	1919	17,579	.3

Even this limited supply of arable land is not properly utilised for productive purposes. A large part of it has not yet been brought under cultivation, while another large section is left fallow every year, as shown in the table below. It is seen that of the total arable land, the acreage sewn with crops in British Provinces amounted to only 55·7 per cent in 1884-85 and 54·6 in 1920-21, showing little tendency for the appropriation of arable land for cultural purposes. Of the un-appropriated land, the acreage of fallow land varied from 8·3 per cent in 1884-85 to 15.7 per cent in 1920-21, and of the culturable waste other than fallow, from 36·0 in 1884-85 to 29·3 in 1920-21, showing a greater tendency towards the fallowing of arable land in recent years.

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(1) Adapted The World's Almanac, 1924, Yearbook of U S Department of Agriculture in 1920 A Geography of the World's Agriculture by V C Finch and O E Baker, Washington D C, 1917 and Statesman's Yearbooks For population see *Supra*

TABLE—10.

Appropriation of Arable Land in British Provinces, 1884-85 to 1920-21.

Year	Culturable waste other than fallow		Fallow land		Net area sown		Total arable land
	Acreage in 1000	Per cent of total	Acreage in 1000	Per cent of total	Acreage in 1000	Per cent of total	
1884-85[1]	82,046	36.0	19.026	8.3	125 955	55.7	227,027
1890-91[2]	99,813	31.0	26.908	10.8	194.414	58.2	321,135
1900-01	140,727	30.8	42 220	12.2	197 116	57.0	344,005
1910-11	115 097	29.9	46.948	12.2	223,065	57.9	385,110
1920-21[3]	114,848	29.3	61.347	15.7	212,259	54.6	388,454

[1] Agricultural Statistics of British India, Calcutta, 1886, p 1.

[2] *Ibid*, 1896. p. 34.

[3] *Ibid*, 1912-13, 1921-22

A similar proportion of arable land remains unappropriated in Indian States. The wastage of arable land in all India is shown below. It is seen that of 480,273,000 acres of arable land in all India in 1920-21, only 266,431,000 acres or 56.9 per cent, were utilised for cropping. Of the rest, 80,962,000 acres, or 16.8 per cent, were laid fallow[1] and 132,880,000 acres, or 27·6 per cent were not brought under cultivation[2].

TABLE—11.

Wastage of Arable Land in India in 1920-21 (3)
(1000 acres)

Arable land	British Provinces	Indian States	All India	
			Total area	Per cent of total
Current Fallow	61,317	19 615	80,962	16 8
Culturable waste other than fallow	114,848	18,032	132,880	27·6
Net area sown	212,259	54,172	266,431	55·6
Total	388,454	91,819	480,273	100

(1) The maximum period for which land is left uncultivated and reckoned a fallow, varies in different provinces, from two years in the Punjab and the North-Western Frontier Provinces to ten years in the Bombay Presidency, according to local laws and customs. After this period, the land, if still left uncultivated is treated as abandoned, and included under the heading of "culturable waste." Owing to this diversity in practice the classification between "culturable waste" and "current fallow" is of doubtful statistical accuracy. Agricultural Statistics of India, 1922, Vol I p iii

(2) Includes areas such as groves, not classed in the sown area, and also areas under bamboos and thatching grass, when not forming a part of forest areas. *Ibid.*, pp iii—iv.

(3) Adapted Agricultural Statistics of India, Calcutta, 1922, Vol I p iii and 1923 Vol II p iv

Fallowing once served a very necessary function in the economy of agriculture. But with the knowledge of crop rotation and the use of fertilizers, it has become an unnecessary waste. There is also a large area of land which is neglected or has not even been brought under cultivation. Only a part of it is utilised for raising bamboos and thatching grass, but by far the largest part of it is wasted. Taking the current fallow and culturable waste together, it is seen that over 44 per cent of arable land can be added to the actual productive area of the country.

There is still another phase to the question. Having tropical climate, India can devote most of her arable land to more than one crop a year The total area of land which is utilised at present for this purpose amounted, in 1920-21, to 26 912,000 acres in British India and 3,064, 000 acres in Indian States, i.e., a total of 30,006,000 acres in all India. This means practically an addition of 6.2 per cent of culturable area to the existing arable land of the country. With the facilities afforded by irrigation and fertilizers, there is possibility of thus augmenting the arable land of the country imensely.

4 Forests.

Forests form one of the most important sources of national wealth. The importance of forests in conserving moisture, in preventing inundation and and erosion, and in moderating temperature cannot be over-estimated in a country like India, which is subject to tropical heat and rainfall. The value of forests as a direct source of wealth lies, however, in the supply of timber and other building materials The supply of fuel is equally important in India due to the fact that coal and oil resources are not

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(1) Agricultural Statistics of India, Calcutta, 1922, Vol II p. vi, and 1923, Vol II p iv

adequate and water power is still undeveloped. To this must also be added the yield of the so-called minor product., such as lac, caoutchouc and feeds. A large number of industries, such as box and paper-making, also depends upon forests for raw materials. The preservation and improvement of forests are, therefore, of prime importance to national economy.

Forests in India belong to the following chief classes: First, deciduous forests. They are most important and extend from the foot of the Himalayas throughout the country, furnishing the valuable timber of sal, ironwood, teak, red-sander, sandal, rose-wood, ebony, acacia and others. Second, evergreen forests. They are next in importance and grow in the regions of heavy rainfall, comprising *terminalia*, *cendralo*, tuna, wild mango and others, located mostly in the west coast of India and in Burma and Andaman islands. Third, dry forests. They are located in tracts where the rainfall is less than twenty inches, such as the Punjab and Central India. Fourth, Alpine forests. They are located in Northern India, Burma and Assam and comprise roughly the vegetation in the altitudes between 12,000 and 3,000 feet including such varieties as junipar, birch, spruce, fir and cedars, cypress and oak. Fifth, tidal forests. They grow on those alluvial lands which are subject to overflow of tides and are found on the coast of Burma, Bengal and Madras. They are valuable for such timber as *sundari* and for fuel. Sixth, reparian forests. They are represented in the Punjab and Burma.

Forests are more or less fixed in area. But there has been slight increase due mostly to the annexation of new territories, as seen below. Taking into consideration the figures for 1900-01, which are more complete, it is noticed that the forest area increased from 208, 364 square miles to 250, 473 square miles within the last twenty years. During the same time, the proportion of forests to total area increased from 21. 97 per cent to 23. 1 per cent, although it fell again to 22.7 per cent in 1921-22.

TABLE—12.

Variation in Forest Area in British India.

Year	Total Land Area	Forest Area	Proportion of forests to land area
1890-91	894,059	112,608	13
1900-01	948,348	208,364	21.97
1910-11	1,071,010	243,478	22.5
1920-21	1,012 266	250,473	23.1
1921 22	1,098,341	249,504	22.7

Thanks to the elevation and rainfall, nearly all the trees of commercial importance are represented in India. There are about 2000 species of timber trees, which are broadly classified into soft and hard wood trees. The soft wood trees are coniferous or cone-bearing and are supplied by the Alpine forests. In India they are mostly inaccessible due to their location in high altitudes. The hard wood trees are broad-leafed and are supplied largely by deciduous forests. Between the two chief classes are to be found all kinds of medium weight trees.

Out af a total area of 1,098,341 square miles in British Provinces, excluding Delhi and Manpur, 249,504 square miles or 22.7 per cent were under forests in 1921-22. This area includes unclassed state forests or "public forest land", which contains in many provinces unoccupied waste, often entirely devoid of trees. (1) The actual forest area would not amount to more than 13 per cent. (2)

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(1) Statistical Abstracts re British India, Calcutta, 1923, p. 354 foot note.

(2) Agricultural Statistics of India, Calcutta, 1924, Vol I. p. iii. On the assumption that the actual area under forests is represented by the records of the Department of agriculture.

There is a good deal of variation in the distribution of forest land in different provinces of the country.' Most of the forests are to be found in a few sections Burma, which is geographically outside India proper, contains about half the forests having 144,708 square miles out of the total forest area of 249,504 square miles. In India proper, Assam has the largest area of forests, i e, 21,463 square miles and is closely followed by the Central Provinces including Berar and Madras with an area of 19 792 and 19,304 square miles respectively, as shown in the table below. It is also seen that the proportion of forests to the total area of the province varies from 10·2 per cent in the case of Bombay to 59 5 per cent in the case of Burma.

TABLE—13.

Geographical Distribution of Forests in British India in 1921-22 (1)

Province	Total Area	Forest Area	Proportion of forests to tota area
Burma	243,232	144,708	59·5
Assam	49,217	21 463	43 6
Central Provinces and Berar	99,917	19,792	19 8
Madras	142.257	19,304	136
Bombay	123,225	12,532	10 3
Bengal	78,668	10,621	13 5
Other Provinces	361.765	21,081	5·9
Total.......... ...	1,098,341	249,504	22,7

(1) Annual Return of Statistics re Forest Administration in British India. Calcutta. 1923. p. 1.

The forest area of the world excluding parts of Asia, South America and Africa, amounts to 1618 million hectars or 24 per cent of the land area i.e., about the same proportion as that in India. But in proportion to population the forest land in India is quite inadequate to supply the needs of modern life. This is clearly brought about by comparing the per capita forest area of India with that of other countries, as shown in the table below. It is seen that the forest area per inhabitant varies from .02 hectar in the case of the United Kingdom to 7.6 hectars in the case of Australia. Excepting the United Kingdom, Belgium and Italy, India has the smallest forest area per inhabitant, which amounted to ·14 hectar in 1920-21

TABLE—14.

Per capita Forest Area in Various Countries.[1]

Country	Total area of woods and forests (millions of hectars)	Per capita area of woods and forests (hectars) (2)
Australia	41.2	7.6
Argentine	42.1	4.9
Russia (European)	155·8	1.5
Austria	9.7	1.5
Hungary	9.0	1.1
Canada	7.0	.81
United States	77.0	.72
Japan	18.4	.24
France	9.7	.24
Germany	14.2	.23
India (British)	35.1	.14
Italy	4.5	.11
Belgium	.51	.07
United Kingdom	1.2	.02

(1) Adapted Annuaire Internationale de Statistique Agricole, Rome, 1920, p p 1—17

(2) The population of Argentine has been taken at 8.6 millions The population of other countries has been given before.

5. Fisheries.

Fisheries also form a very important source of national wealth. The function of fishes to a country are various. First, they make a very delicious and nutritious food. Second, they are the chief means of exploitation and conservation of such small plants and animals as algae and protozoa—a function which becomes all the more important in a country like India because of its tropical climate and prolonged rainy season. Third, they feed upon the eggs and larvae of such injurious insects as mosquitoes and thus render a very valuable service in the prevention and control of diseases like malaria. (1) Fourth, they supply raw material for such industries as those relating to oil, glue and manure. Fifth, fishing develops some of the best qualities of character such as courage, enterprise and ingenuity and thus helps the up-building of national life.

Like Japan, North America and most of the European countries, India possesses large fisheries, which may be divided into three classes First, freshwater fisheries including rivers, brooks, ponds, jheels, tanks marshes and rice-fields. Second, brackish water fisheries of estuaries, creeks and lagoons. Third, marine fisheries consisting of the foreshore and deep water.

There are in India 437 genera and 1,637 species of fishes and of these, 79 genera and 361 species are fresh water fishes and the remaining inhabit either brackish or sea water. The number of migratory fishes is rather limited. There are about 53 different kinds of fishes considered to be edible in India. (2) The main varieties of inland fishes are hilsa, rohu, catla, vetki, murrel, carp, trout and cat fishes. Among the brackish water and marine fishes the following are the chief : sardins, mackerel, cat fiishes, seer, sole, mango fishes, pomfret, vontrils, shark and ray fishes. Among the other fiisheries, the oyster, turtle, pearl, mussel and chank are the chief..

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(1) Cf. Madras Fisheries Bulletin XI, p 161.

(2) A statistical account of fish supply in Madras, Madras, 1923, pp. 133—34.

The most importont fresh water fisheries in India are located in Bengal, Bihar and Orissa, large sections of which are occupied by rivers and their branches and tributaries. The inland water of these provinces has an area of about 8,000 square miles, which during the rainy season is more than doubled. (1) The rivers in Madras, Sind and the Punjab are also important sources of fish-supply. In short, the inland water-fisheries of India are not excelled either in area or potentiality by any other fisheries except those of the United States. There are also large areas of brackish water fisheries, the most important of which are the Sundarbans occupying an area of 5700 square miles. They are teeming with several species of valuable fishes which are within the easy reach of Calcutta and other lucrative markets. (2)

The richest fisheries of India are, however, the marine, including both the foreshore and deep water. Madras has a coast line of 1750 miles with a shallow water area of 10,000 square miles. An equally large or larger area extends from the coast of the Bay of Bengal to Burma and Malaya peninsula. Another important area of fishable water is the Arabian sea. The fine weather of Bombay coasts permits even small crafts to fish for more than half the year. The marine fisheries of India are practically inexhaustible.

6. Mines.

Another source of wealth to a country are the mines. Precious metals, such as gold and silver, satisfy the desires of a large number of people for decoration and ornamentation. Of still more importance are the minerals, such as copper, zinc, tin, and sulphur, which form basic materials for many manufacturing industries. But the greatest value of the minerals lies in the supply of material for machinery and mechanical power. From this viewpoint, iron, coal and oil are the most important mineral products and form the motive force of modern industrial civilisation.

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(1) Reports on the results of enquiry into the fisheries of Bengal and fishery matters in Europe and America, Calcutta, 1908, p. 4

(2) Annual Report of the Department of Fisheries, Bengal, Bihar and Orissa, Calcutta, 1920, p 7

For the convenience of study, mineral resources may be classified as fuels, metals and non-metals. Among the most important fuels are coal, oil peat and gas, of which the first two are found in comparative abundance in India Metals consist of such important minerals as iron, gold, silver and copper. Unlike the mineral fuels, which are ' perishable" and are exhausted in a single use, metals are more or less durable and a large portion can be preserved in tact, although through wear and tear, oxidation and other chemical changes, parts of them are lost. The metallic stock of gold and silver thus increases every year. Except iron, the supply of most of the metals is rather limited in India The non metallic minerals consist of such structural meterials as lime, sand, cement and clay ; abrasive materials, such as millstone and emery ; chemical meterials such as arsenic, borax, gypsum, salt and sulphur ; pigments such as barytes , and miscellaneous materials such as asbestos, graphite and magnesite. (1) India has considerable supply of some of these non-metallic minerals.

Coal is the most important of all minerals, both because it is a source of motive power and because it yields a large number of important by-products. The coal seams of India occur in deposits younger than those in which the principal fields

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1. Van Hise, C R, Conservation of Natural Resources in U S, New York, 1910, p 102

of Europe are found. Sufficient information is not yet available for estimation of the reserves beyond the depth of 4,000 feet. The total superficial area for which the estimate is made, is 3333 square miles.

In comparison with those in other countries, the coal reserves in India are rather small, as shown in the table below. It is seen that the United States with Alaska is far ahead of other countries in the possession of coal reserves, which amount to 3,500,000 million tons. Canada and China occupy the second and third places having respectively 1,361,000 and 1,100,000 million tons. India with a reserve of 87,000 million tons stands seventh in the list and leads countries like France, Russia and Japan.

TABLE—15.

Estimated Coal Reserves in Chief Countries. (1)

Country	Total Reserves (millions of metric tons)	p. c. of total
United States with Alaska	3,500,000	45.4
Canada	1,361,000	17.4
China	1,100,000	14.3
Siberia	192,000	2.4
British Isles	166,000	2.1
Germany	148,000	1.9
India	87,000	1.1
Poland	68,000	15.4
Ukrania	55,000	
Czecho-Slovakia	24,500	
Indo-China	22,000	
France	18,000	
Russia (European)	12,000	
Belgium	11,000	
Japan	9,000	
Other countries	912,000	
Total	76,855,500	100

Petroleum is another important fuel mineral. Like coal, it furnishes many by-products. Petroleum is found in two distant areas in India. The one is on the east including Assam, Burma and the islands of the Arakan Coast and extends to Sumatra, Java and Borneo. The other is on the west, including the Punjab and Beluchistan and extending to Persia. Of these two areas, the eastern area is by far the more important.

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(1) The World Almanac, New York 1924, p. 746

(2) The latest scientific investigation of the coal reserves of the world was made in 1913, when the coal reserves were classified according to their fuel value and accessibility The total reserves amounted to 7,258,966,000,000 metric tons

The known resources of the world's petroleum amount to 45,055,000,000 barrels of 42 gallons each, as shown in the table below. It is seen that South America including Peru, Bolivia, Columbia and Brazil possesses 9,280 million barrels or 20.6 per cent. But as far as a single country is concerned, the United States stands first and possesses 9,000 million barrels or 20 per cent and is followed by Russia with 6,755 million barrels or 15 per cent. India has the resources of only 995 million barrels or 2.3 per cent of the world's total amount.

TABLE—16.

Petroleum Resources of the World. (1)

Region or country	Quantity in million barrels of 42 gallons each	Percentage of total.
South America	9.280	20.6
United States	9,000	20
Russia including Saghalian	6.755	15
Persia and Mesopotamia	5.730	12.7
Mexico	4.725	10
East Indies	3.015	6.6
China	1 375	3
Japan & Formosa	1 235	2.7
Europe	1.135	2.5
Canada	995	2.2
India	995	2.2
Algeria and Egypt	925	2
Total	45,055	100

(1) Adapted. Some Great Commodities. New York, 1923. p III.

Water is still another source of power. Unlike coal and petroleum, which are perishable and exhaustible, the supply of power from water resources is permanent and practically inexhaustible, though limited.

A preliminary forecast shows that India has the following water power areas: First, nearly the whole of Burma Second, the whole of Northern India along the Himalaya ranges, comprising Assam, Northern Bengal, the United Provinces, the Punjab and the North-western Frontiers. Third, the whole of Western Ghats in Bombay and down to Southern India. Fourth, on a smaller scale, Madras and Central Provinces. It has been estimated that the water power resources of India amount to 27,000,000 horse power.

In comparison with other countries, India stands very high in water power resources. The water power resources of the world have been estimated to be 439,000,000 horse powers and of these resources, 190,000,000 horse powers are located in Africa alone, mostly in the Congo river regions. Taking into consideration only the advanced countries, the United States with the resources of 28,000,000 horse powers stands at the head of the list and is closely followed by India with the resources of 27,000,000 horse powers, as seen in the table below. Brazil with 25,000,000 horse power resources occupies the third place. Canada and China each with 20,000,000 horse power resources compete for the fourth place In proportion to population, some of the smaller countries, such as Norway and Sweden, are, however, better supplied with water power resources than China, India and even the United States.

In respect to the development of the water power resources, the credit lies with European countries, as shown in the same table. Switzerland and Germany, for instance, have developed respectively 76 and 74 per cent of their water power resources. Among the other important countries, the United States has developed 33 per cent, Italy 32 per cent, France 29.7 per cent, Sweden 26.7 per cent, Norway 24.5 per cent, and Japan 16.6 per cent. The developed water power resources of India amount to only ·55 per cent of the potential wealth.

TABLE—17.

Water Power Resources in Chief Countries.

Country	Potential Horse Power	Developed Horse Power.	Percentages of developed to potential
United States	28,000,000	9,213,000	33
India	27,000,000	150,000	·55
Brazil	25,000,000	250,000	1
Canada	20,000,000	2,118,000	12
China	20,000,000	1,650	·008
British Isles	9,000,000	200,000	2 2
Japan	6,000,000	1,000,000	16 6
Mexico	6,000,000	400 000	6 6
Norway	5,500,000	1,350,000	21·5
Agentine	5,500,000	25,000	·5
France	4,700,000	1,100,000	29·7
Sweden	4 500,000	1,200,000	26·7
Spain	4,000,000	600,000	15
Italy	3,800 000	1,150,000	32
Germany	1,350 000	1 000,000	74
Switzerland	1,100,000	1,070,000	76

Regarding the energy resources of the world, a very interesting estimate has been made by Dr. Thomas T. Read of the Federal Bureau of Mines, U.S. Government. Taking the estimates of probable and possible available coal, petroleum and water power in the principal countries of the world and reckoning them in terms of millions of horse power years, they line up, according to his estimate, as shown in the table below. It is seen that the United States with 500,000 million horse power years of coal, 400 million horse power years of petroleum and 37 million horse power years of water, is the most powerful country in the world, and is followed by China, Germany, Canada and other countries. India with 11,000 million horse power years of coal, 70 million horse power years of petroleum and 20 million horse power years of water stands ninth in the list of the powerful countries.

TABLE—18.

Energy Resources of the World. (1)

Country.	Coal	Petroleum.	Water power
	(millions of H. P. years)	(millions of H. P. years.	millions of H. P. years)
United States	500,000	100	37
China	200,000	60	20
Germany	18 000	2	2 5
Canada	10,000	10	22·5
Great Britain	27,000		
Australia	19,000		1
Russia	17,000	280	
Poland and			16
Czecho-Slovakia	11,000	15	1
India	11,000	70	27

The most important mineral is, however, iron. Machinery and mechanical power are the two main pillars of the modern industrial organisation. While power can be supplied by water or by any of the fuel resources such as coal and oil, there is no known substitute for iron.

Metallic iron is scarcely found in a pure state. The value of iron depends upon the proportion of iron contents and the nature of other composing elements. Some of the ores are known to contain as much as 72 per cent of iron, but ores with 60 per cent of iron are regarded to be of a highly desirable grade .The ores of commercial value must have at least 25 per cent of iron.*

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(1) The World's Almanac, New York, 1924, p 744

The iron ores of India have not yet been fully explored. But vast iron ore dosposits have been discovered in Singhhum, and in the Keonjhar, Benai and Mayurbhanj States of Orissa. These iron ores lie on the average at a distance of 125 miles of the fuel supply area and contain more than 60 per cent of iron. They are among the largest and richest resources of the world and are distributed as follows: (1)

District	Quantity in ton.
Singbhum	1,071,000,000
Keonjhar States	806,000,000
Bonal State	656 000,000
Regions between the above two	280 000,600
Mayurbhanj State	16,000,000
	Total...2,832,000,000

In comparison with other countries, India occupies a very high place in the possession of iron resources, as shown in the table below. It is seen that France, as she has been constituted by the recent Verseilles Treaty, possesses 5630 million tons of ores, which amount is the largest in the world. But the United States leads the world having the largest amount of metallic iron. India with 2,832 million tons of iron ores and 1,699 million tons of metallic iron stands fourth among the countries.

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(1) Records of the Geological Survey of India, Calcutta, 1922, Vol LIV part 2 pp 203—212

TABLE—19.

Iron Resources in Chief Countries. (1)

Country	Iron Ore	Iron Contents.
France	5630	1895
United States	4250	2935
New Found Land	3630	1750
India	2832	1699[3]
Cuba	... ..	1080
Norway and Sweden	1525	864
Great Britain	1300	455
Germany	1262	511
Russia	831	376
Spain	711	349
Luxemburg	270	90
Austria	213	75
Other European Countries	290	115

Of the other minerals, India has an unusally wide range of resources in variety though not in quantity.

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(1) Mineral Industry during 1921, New York, 1922, pp 306—27 Records of Geological Survey of India, Calcutta, 1922, Vol LIV, part 2, pp 203—212

(2) Some Great Commodities, New York, 1923, p 68

(3) Calculated

CHAPTER III.

INDUSTRIES

1, Forestry

As an industry, forestry presents some peculiarity which distinguishes it from other industries. A forest of valuable timber takes a long time to mature, generally from 50 to 100 years according to the softness or hardness of the wood. An individual can scarcely feel interested in an industry of which neither he himself nor his immediate successors can reap the benefit. Even when possessed of a natural forest, an individual is scarcely interested in preserving it for social benefit. This is clearly seen in the case of the United States When first discovered there were 822,000,000 acres of forests, of which now only 463,000,000 acres are left. A similar thing happened in India. In the early part of British rule, forests were rapidly destroyed. The acreage of agricultural area and the construction of railways were pushed forward at the cost of forests. It was the shortage of timber to meet the demand of public works that led to the realisation of the necessity of forest service. Forestry has therefore become a public or semi-public industry in India as in other countries.

Although local efforts were made in Malabar. in 1806, in Bombay in 1847, and in Madras in 1856, it was only in 1864 that an inspector-general of forests to the Government of India was appointed and a department of forestry was created. Forest administration is a division of the Department of Revenue and Agriculture. Subject to the general supervision of the Government of India, the administration of forestry rests with Provincial Governments. The first forestry act was passed in 1865 and since then several local and national acts have been passed. The policy of the government is to develop forests and to protect them from disease, fire, grazing animals and unauthorised felling.

For administrative purposes, forests in India are divided into three classes, namely reserved, protected and unclassed, according to the degree of State control. The reserved forests are under the direct control of the Government. They are intended to be maintained permanently for the supply of timber, fuel and other products or for the protection of water supply or other similar purposes. The protected forests are those in which the control is not so strict and to which local communities have benficial exercise of rights. The unclassified forests are those in which there is practically no restriction for the use of the public. Of the 249, 504 square miles of forests in 1921-22, 103,789 square miles, or 41 per cent, were reserved, 7,550 square miles, or 3 per cent, were protected, and 138,165 square miles or 56 per cent, were unclassed. The last class of forests are mostly located in provinces where there is a scanty population, such as Burma and Assam.

The outturn of forests in India is classified under two heads, major products consisting of timber and fuel and minor products comprising bamboos, grazing and fodder grass and such other products as lac, caoutchouc, myrabalans and cardamoms. They are disposed of either by the Government directly or by purchasers and rightholders.

The outturn of forest products within the last 16 years, i. e., from 1905-6 to 1921-22, is shown below. It is seen that although forests have increased very little in the acreage, there has been some decided increase in the produce per square mile, rising from 1,054 cubic feet to 1,448 cubic feet in timber and fuel and from Rs. 27 to 35 in the value of minor products, i.e., while the area increased by 6 per cent, the outturn of timber and fuel increased by 46 per cent and that of minor products by 100 per cent.

TABLE 20.

Increase in the Outturn of Forest Produce. (shown at every five years.) (1)

Year	Total area in square miles	Total Outturn.		Outturn per Square Mile	
		Timber and Fuel (Millions of cu ft)	Minor produce (Lakhs of rupees)	Timber and Fuel (cu ft)	Minor produce (Rs.)
1905-06	233,651	246.33	69.1	1,054	27
1910-11	243,478	260.58	95.2	1,070	39
1915-16	249,000	286.21	116.8	1,149	47
1920-21	250,473	298.6	126.0	1,192	54
1921-22[2]	249,504	361.3	138.0	1,448	55

(1) Statistical Abstracts for British India, Calcutta, 1923 p 355
(2) Annual Return of Statistics re Forest Administration in British India, Calcutta, 1923. p 17

The timber production of India is not sufficient for her large population. It has been estimated that the annual growth is about 1200 million cubic feet, of which only 361 million cubic feet or 30 per cent was cut in 1921-22. But even if the whole growth is cut, the supply of timber would be quite inadequate to the needs of the people. Some idea of India's position in timber supply may be had from the following table. It is seen that even countries like Austria-Hungary or Sweden produce more timber than India, i.e., 2,827 million cu. ft. or 950 million cu. ft. as against 361 million cu. ft.

Table—21

Timber Production in Some Chief Countries. (1)

Country	Year	Quantity in millions.
Canada	1920	1.3 M. board ft.
United States	1920	33. 8 „ „ „
Norway	Annually	345 Cubic. Feet.
Sweden	Pre-war average	950 „ „
India	1921-22	361 „ „
Austria-Hungary	Pre-war average	2,827 „ „

One of the functions of forests is the supply of grazing land to domestic animals. In 1921-22, 11. 8 million animals were allowed to graze in the public forests, of which 6. 6 millions were allowed on payment of fees and 5 2 millions were allowed free. Every year a large amount of forest products is given away free or sold at reduced price. The value of such products amounted to 85.7 lakhs of rupees in 1921-22 The importance of forests to national production is also seen in the value of their exports, which amounted to 9.9 crores of rupees in 1921-22.[1] Almost the same amount in value of timber was imported during that year.

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(1) Collected Cf Some Great Commodities, New York, and Statesman's Yearbook

The table below shows the growth of the forest production in India for the past 16 years.[2] Taking the figures for 1910-11 for which complete data are available, as the basis of comparison, it is seen that the production has increased by 35 per cent.

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(1) Annual Return of Statistics relating to Forest Administration in British India. Calcutta, 1923, pp 15, 22, and 30

(2) Previous statistics are not useful for showing the growth of productivity in the method used here

Table—22.

Growth of Forest Products in India.* (1)

Year	Timber & Fuel (millons of cu. ft.	Minor produce (lakhs of rupees)	Grazing animals (millions of heads)	Produce given away or sold at reduced price	Productivity (mean average of units)	Index number
1905-06	246 (2)	55		35		
1910-11	261	95	14 6	54	106	100
1915-16	286	117	13 6	85	128	120
1920-21	299	136	12 1	88	134	126
1921-22	360	138	11 8	86	144	135

(1) Annual Return of Statistics re Forest Administration in British India, Simla. 1911-23

(2) For Bombay, Madras and Bengal Excluding 210 million cu ft of bamboos.

Unlike other industries, forestry is a public or semi-public enterprise, as noted before, and the profit is largely appropriated by the Government. The surplus from the revenue is also a fair indicator of the growth of forestry, as shown below. It is seen that in 30 years from 1890-91 to 1920-21, the amount of revenue increased from 149 lakhs to 541, the expenditure from 80 lakhs to 364, During the same time the surplus rose from 69 lakhs to 177, showing an increase of 158 per cent.

TABLE—23.

Growth in the Surplus Value of Forestry.

Year	Revenue (Lakhs of Rs)	Expenditure (Lakhs of Rs)	SURPLUS Amount (Lakhs of Rs)	Per cent of increase compared with 1819-91.
1890-91	149	80	69	
1900-01	197	111	86	24
1910-11	274	152	121	75
1920-21	541	364	177	158

2. Fishing.

Fishing is one of the oldest industries of the world. It has come down from pre-historic times. A considerable number of the world's population is supported by fishing. In India alone 1.5 million population depends upon fishing for their livelihood, according to the census of 1921.

The methods of catching fish in India are still very primitive. Among the implements, the most important are the following: (1) fixed engines and nets; (2) moveable engines, nets, traps and other contrivances, (3) missile implement such as spears and arrows; (4) baited hooks, springs, rods and lines and bottom lines, (5) twisted cards and knots. The nets are of various kinds, square, round, medium and minute sized, meshed and drifting with one or two *catamarons.* Among the fishing boats are to be mentioned *dug-outs, dingis* or small boats and big boats With these primitive and obsolete implements and with illiterate and so-called lower caste fishermen, India has made very little progress in fishing industry, especially in brackish or sea water areas.

The richness of fisheries in India drew the attention of naturalists and amateurs even in the last quarter of the 18th century. They occasionally described and classified fishes until the middle of the 19th century. In 1867, Sir Arthur Cotton, an irrigation engineer, pointed out to the Secretary of State for India, the danger to the coastal fisheries of Madras arising from weirs in the rivers. The same year, the Government of India made inquiries into the general conditions of the fisheries of the country. In 1868, Colonel Strachey, the Inspector General of Irrigation Works, suggested the institution of an inquiry into the migration, spawning and other habits of edible fishes. In consequence, Surgeon Major Francis Day was appointed to investigate the question of weirs in the rivers of Madras and other provinces. The same year, he was made the Inspector General of Fisheries in India He made several reports on fresh water and marine fish and fisheries in 1873. After his death in 1889, all the interest in the fisheries subsided.

Meanwhile Colonel Alcock made an investigation of the fisheries of the Bay of Bengal and found them to be of inestimable value. But no work of practical importance was undertaken until 1905, when the Government of Madras initiated an enquiry into the possibilities of fishing industries, both fresh and marine water, under the supervision of Sir F. A. Nicholson. Soon after the publication of the report of this investigation, a department of fisheries was established in Madras.

The Government of Bengal started in 1906 a similar investigation under the direction of Sir (then Mr.) K. G. Gupta, who made his report in 1908, giving some very valuable suggestions. The Government of Bengal acted immediately upon the report and appointed a board and a department of fisheries, the latter being afterwards amalgamated with the Department of Agriculture.

The most important outcome of Sir K. G. Gupta's investigation was the appointment by the Government of Bengal of Dr. J. T. Jenkins, who, with the help of the trawler Golden Crown and the launch Ila, made several voyages on the Bay of Bengal and the estuaries of the Sunderban. He located and charted the fishing regions and ascertained the kind and quality of fish. He proved that sea fish could be landed in fresh condition in Calcutta from places as far distant as Akyab and that the average catches of the Golden Crown compared very favourably with those of the trawlers working in the White Sea, Bay of Biscay, North Sea, Irish Sea, English Channel, Iceland, Portugal and Morocco. But no practical step has yet been taken to tap these fish resources.

There does not exist any estimate as to the amount of the annual catch of fish in India. Fishing is mostly restricted to the inland water over a wide area and the products are consumed locally. Recently some data have been collected of fish supplies to the markets of Madras and Calcutta.

In the City of Madras the fish consumed in the year 1921-22 amounted to 4 million pounds in weight and Rs. 5·6 lakhs in value. (1) A more detailed account of fish supply to Calcutta is shown in the following table. It is seen that in the year 1905-06, for which the first statistics are available, 194,000 maunds of fish were imported into Calcutta by railways and water ways. It rose to 435,000 maunds in 1922-23, showing an increase of 224 per cent, as indicated by the index number.

TABLE—24

Fish Supply to Calcutta.

Year	Quantity in maunds (round numbers)	Variation. (index numbers)
1905-06[2]	194,000	100
1912-13	192,000	98.9
1913-14	144,000	74.2
1914-15	126,000	64.9
1915-16	240,000	123.7
1916-17	217,000	111.8
1917-18	301,000	155.1
1918-19	306,000	157.7
1919-20	313,000	160.1
1920-21	370,000	190.7
1921-22	418,000	215.4
1922-23	435,000	224

Fishing affords a large number of branch industries, but they are practically undeveloped. The modern methods of fish-preservation, such as canning, have not made any headway. The old-fashioned ways of preserving fish were drying in the sun or artificial heat, and dry and wet salting. The principal by-products of fish are isingglass, fins, skins, orbs, whips and manure.

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(1) A statistical account of fish supply in Madras, 1923, pp. 133—34. Report on the results of the enquiry into the fisheries of Bengal and into fishery matters in Europe and America, Calcutta, 1908, p 25, adapted.

(2) Department of Fisheries, Bengal and Bihar and Orissa, Bulls 12, 16, 20.

From the fish supply to Calcutta and Madras, a very rough estimate may be made of the annual catch of fish for the whole country. (1) There are, however, several assumptions on which such estimation is based : First that the per capita fish consumption in the country is the same as in a city like Calcutta or Madras. Although in the country the fish supply is more abundant during certain seasons, in the city it is more steady throughout the year. Second, that as far as the fish consumption is concerned, Calcutta is the representative of the provinces of Bengal, Bihar and Orissa and Assam, and Madras represents the provinces of Madras and Bombay and that these provinces include practically all the fish consuming regions of the country except Burma. Third, that the population of the latter provinces in 1921-22 was the same as in 1920-21 according to the census. There is a variation in population from year to year and any calculation on the basis of population requires necessary correction. But the estimation made here is too rough to need such minute correction

In 1920-21, the total population of the provinces of Bengal, Bihar and Orissa and Assam amounted to 82.6 millions and that of the provinces of Madras and Bombay to 61 5 millions. Now it has been shown that 1.32 million people in Calcutta consumed 370, 100 maunds or 26.2 million pounds of fish in 1920-21 and that 500,000 people in the city of Madras consumed 4 million pounds of fish in 1921-22. On the basis of the assumptions laid down above, a simple calculation would give 1639 million pounds of fish for Bengal, Bihar and Orissa and Assam and 473 million pounds of fish for Madras and Bombay Presidencies or in other words, 2112 million pounds of fish for all these provinces. To this sum must be added

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(1) Excluding Burma.

100 million pounds of fish which are consumed in 140 establishments on the coast of Madras. The total catch amounts to 2212 million pounds.

The importance of deep water fishing to the wealth of a country can be seen by the amount and value of the annual catch of various countries, as shown in the table below. It is seen that the value varies from 3 crores of rupees in the case of Germany to 240 crores in the case of the United States. According to the estimate made above, the annual catch of fish in India amounted to 2112 million pounds in 1921-22 valued at 29.5 crores of rupees.

TABLE—25

The Fishing Industries of Principal countries,[1]

Country	Year	Amount in millions of pounds	Value in crores of rupees.[2]
United States including Alaska	——	2,500	240
England & Wales	1920	1,633.5	31.8
France	1919	——	25.4
Japan	1910	——	18.9
Russia	——	1.206	15.0
Canada	1920	851.2	14.7
Holland	1919	367.3	6.9
Sweden	1918	300	6.7
Germany[3]	1919	254.4	3.2
India (estimated)[4]	1921-22	2,112	29.5

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(1) The World Almanac and Encyclopedia, 1922, p. 237.
(2) Changed from dollars to rupees at the rate of Rs 3 to 1
(3) German catch of fish in 1920 amounted to 429.2 million pounds.
(4) Excluding Burma

3. Mining.

Mining and metallurgy were among the most important and highly developed industries in ancient India. Before the advent of the British, there flourished in the country such mineral industries as the manufacture of alum, alkaline compound, blue vitriol, lead, iron and steel and achieved a prominent place in the ancient metallurgical worlds. India anticipated the modern process of manufacturing steel and exported brass, borax and nitre. In the face of modern competition, the ancient industries have declined, but modern methods have not been sufficiently developed in India to raise her to the level of modern industrially advanced countries.

The mining products of India consist of such minerals as iron, coal, petroleum, salt, gold, chromite, copper, diamond, graphite, jadstone, lead, mangesite, manganese, mica, silver, saltpeter, tin, zinc and wolfram. India virtually controls the world's production of mica and manganese ore.

Coal production is the most important mining industry in India. The coal fields are not only comparatively few in number, they are also remote from sea-ports and centers of manufacture. Of the numerous coal fields of proved value in India, 18 are actually being worked, but only seven are of any considerable importance, while 89 per cent of the output is produced in the Raniganj and Jharria fields. The output of coal in 1879-80 was only .98 million tons. It rose to 2,167 million tons in 1890 and to 19.5 million tons in 1921. The amount of coal production in India as compared with that in other countries is shown in the table below:

TABLE—26.

Coal Production in Chief Countries in 1921.

Country	Quantity (millions of metric tons)	Per cent of total.
United States	457	38.0
Germany	169	14.0
United Kingdom	166	13.6
France	29	2.4
Japan	26	2.1
Belgium	22	1.8
India	19.5	1.6
China	19	1.5
Other countries	292.5	24.3
Total...	1200	100

The above table shows that the United States raised, in 1920, 457 million tons of coal, i. e., more than the combined production of Germany and the United Kingdom, which countries raised respectively 169 and 166 million tons of coal. The coal production of other countries varies from 19 to 29 million tons. India and China both produced practically the same amount of coal and occupied the 7th place in the list of the countries mentioned above.

More rapid progress has been made in the production of petroleum than in the case of any other mineral. In 1890, there were only 41 gallons of oil raised and in 1920, the production rose to 293 million gallons. To the production of the world's petroleum, India's contribution was rather small. Of 769 million barrels of the world's production in 1921, the United States produced 469.6 million barrels or 61.7 percent, Mexico 195 million barrels or 25.3 percent, Russia 28.5 million barrels or 3.7 per cent, Dutch East Indies 18.0 million barrels or 2.3 per cent, Roumania 8.3 million barrels or 1.0 per cent and India 6.8 million barrels or .8 per cent. The rest of the countries produced the remaining 5.2 per cent, as shown in the table below :—

TABLE—27.

Petroleum Production in the World in 1921.[1]

Country	Total quantity (million barrels of 42 gallons each)	Percentage of total.
United States	469.6	61.7
Mexico	193	25.3
Russia	28.5	3.7
Dutch East Indies	18	2.3
Roumania	8.3	1.0
India	6 8	.8
Galicia	3.6	5.2
Japan	2.6	
Peru	3 5	
Trinidad	2.3	
Egypt	1.1	
Total	769	100

Next in importance is gold mining. Small quantities of gold are washed in river gravels in various parts of the country, but it is chiefly mined from a rich reef in the Kolar field in the State of Mysore. The work began early in the eighties of the last century and is continued.

India's share in the production of the world's gold supply is shown in the table below. It is seen that the value of the world's production of gold in 1921 amounted to 95.7 crores of rupees and that of India 2.9 crores of rupees or 3 percent of the total.

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(1) The Mineral Industry during 1921, New York, pp 504—05.

TABLE 28.

Gold Production in Chief Countries in 1921

Country	Amount (crores of rupees)	Per cent of total.
Africa	56.0	58.5
United States	15.0	15.6
Australia	6.2	6.4
Canada	5.7	5.9
Mexico	4.2	4.3
India	2.9	3.0
Columbia	1.8	1.8
Japan	1.4	1.4
All other countries	2.5	2.6
Total	95.7	100

Manganese is another important mineral in which India holds the world's market, as shown in the table below. It is seen that in 1921 the world's production of manganese ore amounted to 1,140,000 tons of which India produced 679,000 tons or 59 per cent.

TABLE—29

World's Production of Manganese Ore in 1921.[2]

Country	Quantity (1000 long tons)	Percent of total.
India	679	59
Brazil	271	23.7
Egypt	54	4.7
China	25	2.1
Spain	20	1.7
United States	14	1.2
Russia	12	1.0
Other conntries	65	5.7
Total	1,140	100

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(1) World's Almanac, New York, 1924, p 747 Changed from dollars at the rate of 3 rupees

(2) Imperial Mineral Resources Bureau, Manganese, London, 1924, p. 1.

India also produces a considerable quantity of salt. The total production of the world amounted to 17,000,000 tons in 1921. The United States produced the largest amount, i.e., 4,447,000 tons. India stood fifth among the producing countries and raised 1,682,000 tons of salt or 9.8 percent of the total, as shown in the table below :—

TABLE—30.

World's Production of Salt in 1921. (1).

Country	Quantity (1000 long tons)	Percent of total.
United States	4447	26.0
Germany	2158	12.6
China	2042	12.0
India	1681	9.8
United Kingdom	1383	8.1
Russia	968	5.6
France	751	4.4
Japan	506	2.9
Italy	505	2.9
Spain	505	2.9
Other countries	2054	12.0
Total	17,000	100

The most promising mining industry in India is, however, the production of iron ore. Earlier statistics are not available, but from the year 1916, there has been a gradual increase in its production, as shown in the table below. It is seen that the production of iron ore has increased from 411,800 tons in 1916 to 625,000 in 1922, showing an increase of 51 per cent, while in 1921 the increase amounted to 942,000 tons, i.e., 129 per cent.

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(1) Including rock salt, brine salt, and sea salt Imperial Mineral Resources Bureau, Salt, London, 1924, p. 1

Table—31.

Production of Iron Ore in India.

Year	Iron Ore (1000 long tons)	Per cent of increase compared with 1916
1916	411.8	—
1917	413.3	.3
1918	492·6	19·6
1919	563·7	36·8.
1920	588	42·8
1921	942	129·0
1922	625	51.0

Inspite of the increase, the production of iron ore in India is very insignificant, in comparison with that of other important countries as shown in the table below. It is seen that the United States leads the world in the production of iron ore, mining 67,600,000 million tons in 1920, and is distantly followed by France and the United kingdom, producing 13,800,000 and 12,700,000 tons repectively. India produced only 600,000 tons of ore inspite of its immense reserves.

Table—32.

Production of Iron Ore in Chief Countries in 1920.

Country	Quantity (in 1000,000 metric tons)
United States	67.6
United Kingdom	12.7
France	13.8
Germany	6.3
Spain	4.7
Sweden	4.5
Luxemberg	3.7
India	.6

Among the other important minerals might be mentioned zinc ore,saltpetre and lead. The relative importance of different minerals in the mining industry of India may be judged from their respective values given in the table below. It is seen that in 1922, for which complete figures are available, the value of coal amounted to £9,755,300 or 40.8 per cent of the total, that of petroleum to £7,185,000 or 30 per cent of the total, and that of gold to £1,857,000 or 7.7 per cent of the total. The total value of all the minerals amounted to £23,905,000.

TABLE—33.

Mineral Production in India in 1922 (1)

Mineral	Value in £ 1000.	Per cent of total
Coal	9755.3	40·8
Petroleum	7185·0	30·0
Gold	1857·5	7·7
Lead and Lead Ore	945·10	3·9
Manganese Ore	915·0	3·4
Salt	819·2	3·8
Silver	675·2	3.0
Building materials	394.8	1·6
Mica	385·7	1·2
Salt petre	234·9	·9
Tin and Tin Ore	188·9	·7
Jadeite	165·8	·6
Iron Ore	104·4	·4
Other minerals	278.50	1·1
Total	£23,905,300	100

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(1) Records of the Geological Survey of India, Calcutta, 1923, Vol. LV., Part 3, pp. 170—71. Re. is equal to 1s. 4d.

The growth in the value of minerals during the past 25 years is shown in the table below.[1] It is seen that it rose from £3,450,000 in 1898, from which date complete data are available, to £ 23,905,000 in 1922, showing an increase of 591 per cent. It is also noticeable that there is a sudden rise in the value of the minerals in 1920. This was due to fluctuations in the value of the rupee which was 2 s. in 1920 as against 1 s.8½ d in 1919 and 1 s.4d. in 1921.

TABLE—31.

Growth in the Value of Mineral Production.[1]

Year	Total value (£ 1000)	Per cent of increase compared with 1898.
1898[2]	3,456	
1900[3]	4,338	25
1905[4]	5,708	65
1910[5]	7,611	120
1915[6]	10,458	202
1920[7]	30,053	763
1922[8]	23,905	591

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(1) The totals have the obvious defect of being an addition of unlike denominations Export values are the only returns obtainable in some cases which necessarily vary according to the position of mines, while in other cases, the values at the mines have been the only available figures

(1) For four years i.e., from 1894 to 1897, a review of the mineral products of India was issued annually by the Reporter on Economic products The present statistics were first published in 1905 for the years beginning with 1994 Records of the Geological Survey of India, Calcutta, 1906, 32 :3.

(2) *Ibid*, 32 3.

(3) *Ibid*, 32 .7

(4) *Ibid*, 46 ·9

(5) *Ibid*, 46 :9

(6) *Ibid.*, 48 :37.

(7) *Ibid*, 54 :132

(8) *Ibid.*, 56 :171.

Some rough idea of the growth of the mining industry in India for the past thirty years may be had from the table below. It is seen that during the period the production of coal increased by 193 per cent, that of petroleum by 7225 per cent, that of iron ore by 1892 per cent, that of manganese by 429 per cent and that of gold by 366 per cent. The total production grew by 612 per cent, as represented by these minerals.

TABLE—35

Growth of Mineral Production in India.

Year	Coal		Petroleum		Manganese		Iron Ore		Gold		Total	
	Tons (1000)	Percent of increase compared with 1890	Gallons (million)	Percent of increase compared with 1890	Tons (1000)	Percent of increase compared with 1890	Tons (1000)	Percent of increase compared with 1890	Oz (1090)	Percent of increase compared with 1890	Mean Average of units	Index number
1890	2,169	100	4	100	—	—	28	100	107	100	57[illegible]	100
1900	6,199	282	8	950	139	100	63	125	513	379	1375	238
1910	12047	555	214	5275	401	476	55	95	573	435	2738	476
1920	17962	819	293	7225	736	429	558	1892	499	366	4009	712

4 Agriculture

Unlike mining, which is an extractive industry, agriculture is a genetic industry and is based on the breeding of plants and animals The main requirements for agricultural production are fertility, moisture, livestock and implements.

Fertility

The most important element in the agricultural resources of a country is the fertility of soil According to geological formation, the soils of India may be divided under the following heads :

First, the alluvial tracts, which are most extensive and agriculturally most important. They occupy the river basins of the country. The color of the surface soils varies from dark to light fawn or brown The texture also varies from drift sands to stiff clays preventing drainage The soil may extend unaltered in color and texture to a considerable depth, but the substrata are generally found in well-defined layers of sand, clay and loam The amounts of nitrogen and organic matter are generally low. There is an adequate supply of potash, but phosphoric acid is rather deficient.

Second, the Deccan trap formation extends over 200,000 square miles The soils vary in color and texture. On the slopes and uplands, the soils are thin and poor. When disintegrated, the trap furnishes a light-colored sandy or gravelly soil, which is moderately productive only in years of favourable rainfall. The lowlands have deeper color and contain black cotton-soils. Black soils vary in texture and fertility, but all are highly retentive of moisture. There is a sufficient supply of potash, but the amounts of phospheric acid, nitrogen and organic matter are generally small. .

Third, outside the area of the Deccan trap and alluvial sections; crystalline tracts occupy the whole of Peninsular India. The soils vary in color from light to red or reddish brown and in texture from thin and stony to clay-like composition. They are suited to a variety of crops, and like other soils, are deficient in phosphoric acid, nitrogen and organic matter.

Fertility is the power of soils to produce crops. Its essential factors are water, sun-light, temperature, soil bacteria and plant food. There is a good deal of plant food lying potential in soils. What is needed is proper cultivation to make it available. But no soil can supply food to plants indefinitely without being supplied with it from outside. The best source of plant food is the barnyard manure. But a good deal of it is burned in India. On the other hand for lack of funds practically no cultivator uses any commercial fertilizers. It is one of the greatest drawbacks of the agricultural industry in India.

Irrigation

Irrigation has been known to India from time immemorial. Although there is plenty of rainfall in some parts of the country, in others it is neither sufficient nor evenly distributed throughout the year. Irrigation has therefore been a means of supplementing the rainfall and of storing water for use in times of need. Through neglect, most of the ancient irrigation systems have undergone deterioration In recent years, there has been a revival of irrigation works as shown in the table below :

TABLE—36.

Growth of Irrigation Works in India. (1)

Year	British Provinces (1000 acres)	Indian States (1000 acres)	All India	
			Total (1000 acres)	Percentage of increase compared with 1890-91
1884-85	22,470	...	...	...
1890-91	28,308	912	29,220	...
1900-01	30,018	1983	32,001	9
1910-11	40,895	5902	46,797	60
1920-21	48,957	8145	57,102	95

The above table shows that the acreage of land irrigation in 1920-21 amounted to 48,957,000 in British Provinces and 8,145,000 in Indian States. They have increased from 29,220,000 to 57,102,000 acres, i.e., 95 per cent in 30 years.

Agriculture in several provinces depends largely upon irrigation. In Lower Burma, Assam, Eastern Bengal and the Malabar Coast, rainfall is generally heavy and the crops scarcely require any irrigation, but other provinces are more or less in need of irrigation. Of the total area irrigated in British India in 1920-21, 27 per cent were in the Punjab, 23 per cent in the United Provinces, 19 per cent in Madras, 12 per cent in Bihar and Orissa, 6 per cent in Sind and the remaining 13 per cent in other provinces. (1)

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(1) Agricultural Statistics of India, Calcutta, 1922, Vol I. p. 3, and 1923, Vol I p 3.

(2) Agricultural Statistics of British India, Calcutta, 1892, pp. 5 and 39, 1906, pp 8—9, excluding Bengal. The statistics for Indian States are for Mysore only.

The importance of irrigation to crops is shown still more clearly by the proportion of the irrigated to the total area in each of the following provinces, as shown in the table below. It is seen that it varied from 24 per cent in the case of Bihar and Orissa to 80 per cent in the case of Sind in 1920-21.

TABLE - 37.

Proportion of the Irrigated to Total Area in some of the British Provinces in 1920-21. (2)

Province	Total area cropped (1000 acres)	Irrigated area (1000 acres)	Per cent of total
Sind	3,564	2,857	80
Punjab	21,788	12,954	59
N.-W.F. Provinces	1,691	8 88	53
Ajmir-Marwara	315	119	38
United Provinces	34,300	11,195	33
Delhi	190	62	32
Madras	33,073	9,368	28
Bihar and Orissa	24,782	6,013	24

Irrigation works in India are of three different kinds, namely, lift, storage and rivets, which are represented by wells, tanks or reservoirs and canals. The wells and small tanks are often the property of private individuals, but large tanks and canals are generally built by Government.

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(1) Agricultural Statistics of India, Calcutta, 1922, Vol. I p. iv.

(2) Adapted. Agricultural Statistics of India, Calcutta, 1922, Vol. I. pp. iv., 40—43 and 70—77.

The classification of irrigation works in Britis Provinces, for which alone complete statistics ar available, is shown in the table below. It is seen that of the total irrigated acreage of 48 956,000 in 1920-21, only 20,078,000 acres, or 42.9 per cent were irrigated by Government canals, 2,564,000 acres or 5.2 per cent by private canals, 7,236,000 acres or 14.8 per cent by tanks, 14 241,000 acres or 29.6 per cent by wells and 4,835,000 acres or 9.8 per cent by other sources. The table also shows the growth of irrigation works under different systems.

TABLE —38.

Classification of Irrigation Works in British India (1000 acres).

Year	Government Canals	Private Canals	Tanks	Wells	Other sources
1990-91[1]	9,212	945	5386	10,063	2701
1900-01[2]	12,968	2726	4441	9,343	1139
1910-11[3]	16,436	1904	6166	10,214	6176
1920-21	20,078	2564	7236	14,241	4855

The Government irrigation works are grouped under two heads—major and minor works. The major works are again subdivided into productive and protective works, the former being more important. In 1920-21, for instance, of the total acreage of 20,047,000, the major productive works covered 18,319,000 acres or 91 per cent of the total and

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(1) Agricultural Statistics of British India, Calcutta, 1892, p. 5.

(2) Agricultural Statistics of British India, Calcutta, 1906, pp. 50-51.

(3) Agricultural Statistics of India, Calcutta, 1922, Vol. I. p. 76.

minor works only 1,728,000 acres or 7 per cent. The productive works are built with borrowed capital in the expectation of their being self-sustaining and remunerative and protective works with public capital as insurance against famine. (1)

Irrigation has a decided effect on crop production. It often helps to raise more than one crop from the same area. But what is more important, it helps to increase the yield. It is clearly seen in the difference between the yields of crops in the irrigated and unirrigated areas of the Punjab, where more than half the area is irrigated, as shown in the table below. It is seen that the increase in the yield of crops from irrigated areas varied from 20 per cent in the case of jawar to 71 per cent in the case of rice—a fact which proves the influence of moisture on certain crops such as rice.

TABLE—39.

Effect of Irrigation on the Yield of Crops. (2)

(in pounds per acre)

Crop	Irrigated area	Un-irrigated area	Actual Increase	Per cent of Increase
Rice	881	515	366	71
Wheat	964	606	358	59
Barley	1056	679	377	55
Jawar	541	449	92	20
Bajra	568	416	152	36
Maize	1324	822	502	61
Gram	725	588	137	23
Rapeseed	540	339	21	59
Sugar cane	2038	1520	518	34
Cotton	143	104	37	37

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(1) Statistical Abstracts *re* British India, Calcutta, 1923, p. 597.

(2) Agricultural Statistics of India, Calcutta, 1922, Vol. I, pp. 356—57.

Livestock

Livestock serves an important function in national economy. It transforms straw, shrubs, grass and many otherwise useless products into matter and energy and furnishes labor, food and raw material.

The larger livestock of the country may be divided into five important groups (1) the bovine, comprising oxen and buffaloes, (2) the ovine or sheep; (3) the caprine or goats, (4) the chevaline, comprising horses, mules, donkeys and ponies; (5) the porcine or swine. The smaller livestock consists of poultry and bees.

There is practically no livestock of the class of the porcine in India. The other larger classes are grouped under the following heads, as shown in the table below:—

TABLE—40.

Classification of Livestock in India, 1920-21.
(1000 heads)

Classes	British Provinces	Indian states	All India
Oxen			
Bulls	5,618	1,467	7,085
Bullocks	43,318	9,081	52,399
Cows	37,083	9,280	46,363
Calves	30,717	6,423	37,140
Buffaloes			
Bulls	5,437	1,038	6,475
Cows	13,312	3,926	17,238
Calves	9,618	2,184	11,802
Sheep	22,075	12,499	34,574
Goats	24,291	6,276	30,570
Horses	1,696	6,012	2,708
Mules	75	6	81
Donkeys	1,371	33	1,404
Camels	409	118	527

The above table shows that the livestock of the class chevaline comprising horses, mules, donkeys and camels play a comparatively unimportant part in the industrial life of India. In 1920-21, there were 2,708.000 horses, 81,000 mules, 1,404,000 donkeys and 527,000 camels in all India. (1) The use of camels as beasts of burden is restricted mostly to arid regions. Mule-breeding has not found much favour in India. The number of donkeys is also small. The horses are not only small in number, but also small in size and unfit for heavy drafting. The present breeds of horses do not seem to thrive well under the climatic conditions of India and no new breed has yet been produced to suit the needs of the country.

More important than horses and camels are sheep and goats in India, which are raised for the purposes of milk, meat and wool. Goat's milk is extensively used in certain sections of the country. Both goats and sheep are used for meat by Mahomedans and a large number of Hindus. Goat's wool is generally used for the manufacture of blankets, but certain breeds of goats supply wool for the manufacture of shawl. The wool from sheep is rather coarse in comparison with that in colder regions. In 1920-21, there were 30 570,000 goats and 34,574,000 sheep in all India.

The most important domestic animals in India are the cattle, which include both oxen and buffaloes. Of 178,502,000 heads of cattle in 1920-21, there were 142,987,000 heads of oxen and 35,515,000 heads of buffaloes. The function of cattle in India is manifold. First, they are used for labor in cultivation and drafting. Thus of 105,847,000 mature oxen in 1920-21, there were 7,085,000 bulls, and 52,399,000

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1. Agricultural Statistics of India, Calcutta, 1922, Vol. pp. 224—25, and 1923, Vol. II, p. 153.

bullocks or working cattle, that is, half the number of the cattle was used for labor. Besides, the cows which numbered 46,363,000, are also used, at least for part of the time, for labor in the field. Second, they supply milk, butter and the limited demand for meat. Third, together with goats and sheep, they supply hides and skins and other by-products such as bones. Hides and skins form one of the largest items of India's export trade. Fourth, cattle manure is the main source of fertility in India. Buffaloes serve the same purpose as oxen. Their milk is used in several sections of the country and is much richer in butter fat than that of the cow. In swampy regions, they thrive better than oxen. In 1920-21, there were, in all India, 6,475,000 heads of buffalo bulls, 17,238,000 heads of buffalo cows, and 11,802,000 heads of young stock.

There has been an appreciable growth in the number of domestic animals in India during the last 35 years. Accurate and complete data are not available for the livestock in Indian States. The growth of livestock in British Provinces is shown in the table below. It is seen that in 1884-85, there were 22,810,000 heads of cattle, 18,536,000 heads of sheep and goats, 439,000 heads of horses and ponies and 630,000 heads of mules and donkeys. Taking the more accurate data of 1890-91 as the basis of calculation, it is seen that the cattle have grown in number from 66,478,000 heads in 1890-91 to 145,103,000 heads in 1920-21 or 118 per cent, sheep and goats from 29,346,000 heads to 46,369,000 heads or 58 per cent, horses and ponies from 957,000 heads to 1,697,000 heads or 66 per cent, mules and donkeys from 957,000 heads to 1,445,000 heads or 36 per cent.

TABLE—41.

Growth of Livestock in British Provinces.

(1000 heads.)

Year	Cattle (1)	Sheep	Goats	Horses and Ponies	Mules and Donkeys	Camels
1884-85 (2)	22,801	18,556 (7)	...	439	630	...
1890-91(3)	66,478	29,346 (7)	......	957	1057	1·7
1900-01(4)	84,816	17,722	19,139	1306	1227	391
1910-11 (5)	120,658	23,281	30,900	1565	1445	447
1920-21(6)	145,103	22 075	24,294	1697	1485	410

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(1) In the previous statistics, although mature oxen (cattle properly) and buffaloes were calculated separately, their young calves were included under one head It is, therefore, impossible to give correct and exact figures of oxen and buffaloes for previous years. Sheep and goats are included under one head for years and 84—85 and 1890-91.

(2) Returns of Agricultural Statistics of British India, Calcutta, 1886, p. 78 Excluding Bengal.

(3) Agricultural Statistics of British India, Calcutta, 1886, p. 227.

(4) *Ibid*., 1906, p 251

(5) Agricultural Statistics of India, 1918, Vol. I. p. 191.

(6) *Ibid*., 1922, pp. 8-9. (7) Including goats.

Inspite of the growth in number, cattle-raising is not a porfitable business in India. There are several reasons for that : First, religion makes the killing of cattle an act of sacrilege among Hindus, who form the majority of the population. Out of respect for Hindus, many Mohammedans are also averse to the killing of cattle. The result is that most of the cattle in India grow very old and live a long life of inactivity before their natural death. For the same religious belief, the disposal of cattle by killing at the time of approaching drought or famine, becomes impossible, and men and cattle die together without offering any chance for preserving human life at the cost of cattle or even saving the best stock at the sacrifice of the poorer ones. Second, although there are several good breeds in India, the majority of cattle, for example, those of Bengal amounting to one-sixth of the whole, are very poor as far as the yield of milk and energy are concerned. Even for food purposes, they are inferior. This is partly due to the character of the breeds and partly to the lack of sufficient amount of rich and concentrated feed, which is essential for making meat flavory and juicy. Third, cattle as the source of energy are inefficient, though under present conditions in India they may be inevitable.

Of other larger domestic animals on the farm, pigs play a very important part in agricultural economy. They utilise many products and offals of the farm which cannot be done by any other means. Ham, bacon and lard are often the by-products of milk and beef industries. In the United States, pigs are used in turning its most important crop, namely, maize, into meat and fat. The same is true of other countries to a more or less degree. But due to religious belief, the raising of pigs has scarcely found any favour in India. It is untouchable to Hindus and Mohammedans alike. Only a few so called lower classes rear them for their family consumption.

The number of pigs in India is so insignificant that no statistics have yet been collected.

Among the smaller domestic animals, poultry and bees are the most important. The number of poultry, comprising ducks, geese and chickens, is unknown. In turning into food products such as meat and eggs, poultry serve a very important function in utilising the offals from kitchens, tables and barns as well as plantlets and small animals. Bee culture is another important industry in connection with agriculture. In India where every season has its new fruits and flowers, there is a great opportunity of producing honey and wax. They are produced to a limited extent in different parts of the country. But scientific method has not yet been applied to Indian apiculture for extensive production.

In the possession of livestock, India occupies a very high place among the countries of the world. She has the largest number of cattle and the second largest of sheep and goats, possessing 178 million heads of cattle as against 68 million heads of the United States and 66 milion heads of sheep and goats as against 87 million heads of Australia, as shown in the table below. It is also seen that the United States has the largest number of horses, mules and donkeys, amounting to 21 million heads as against 20 9 million heads of Russia and has also the largest number of hogs numbering 73 million heads as against 14 million heads of Germany. India has only 4 million heads of the former and practically none of the latter.

TABLE—42.

Livestock in Principal Countries.

(1000 heads)

Country	Year	Chevaline	Bovine	Ovine	Porcine-
Argentine	1915	8,324	25,867	43,225	2,901
Australia	1920	2,528	12,739	87,086	914
France	1920	2,635	13,217	9,406	4,912
Germany	1920	3.581	16,790	6,240	14,150
Hungary[2]	1910	2,174	7,153	7,905	5,490
Austria	1910	1,803	9,160	2,429	6,431
India	1920	4,498[3]	177,550	65,536	... ...
Italy	1920	990	6,240	11,759	2,339
Japan	1919	1,480	1 345	130	470
Russia (European)	1910	20,961	31,473	40,149	9,744
Spain	1920	594	3,397	19,317	4,434
United Kingdom	1920	1,915	12,491	25,120	3.616
United States	1920	21,209	68,[illegible]32	48,615	72,909

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(1) Annuaire Statistique, Paris, 1923, pp 255-56
(2) Including Slavic Croatia.
(3) Including 547, 002 camels

Inspite of a large stock of domestic animals, India falls far behind other countries as far as their number in proportion to the population is concerned. This is very clearly shown by a comparison of her stock per 100 persons with that in other countries in the table below. It is seen that as to the animals of bovine and chevaline classes, Argentine leads the countries under consideration, possessing 299 heads of cattle and 97 heads of horses including ponies, etc. per 100 persons and is followed by Australia with 236 heads of cattle and 46 heads of horses, etc. With respect to sheep, Australia is, however, far ahead of other countries and has 1,613 heads per 100 persons, Argentine with 503 heads standing distantly second. In the possession of pigs, the United States take the lead, having 68 heads per 100 persons as against 33 heads of Argentine, which has the second largest number. India with 56 heads of cattle and buffaloes and 21 heads of sheep including goats and only one head of horse,etc. per 100 persons, stands respectively fourth, eighth and last among the nine countries mentioned in the list. Moreover, like other countries, she has no pigs, as noted before.

TABLE—43

Livestock per 100 Inhabitants in Various Countries.

Country	Cattle & Buffaloes	Sheep & Goats	Horses & Mules	Pigs
Argentine	299	503	97	33
Australia	236	1,613	46	16
United States	65	46	22	68
India	56	21	1	0
France	34	24	6	12
Germany	28	10	6	23
United Kingdom	24	53	4	7
Spain	16	91	3	21
Italy	15	30	2	6

Implements.

Farm implements in India are comparatively few in number and simple in kind. They form a very small part of agricultural capital in comparison with that of other advanced countries. There are several reasons for this condition, such as the smallness of holdings, cheapness of labor, primitiveness of culture, lack of training and poverty of cultivators. Modern implements have scarcely found their way into Indian farms. Most of the agricultural implements in India are therefore small in size, obsolete in kind and insignificant in value.

The plough is the principal implement, which is supplemented by scarifier and seed drill in the Deccan. Bullock hoes, harrows, levellers and cold crushers are among the other implements used in different parts of the country. Of handtools, crowbar, kodali, picks, sickles and sieves are the chief

Owing to their smallness, there scarcely exists any record as to the number of tools and implements used on farms. Carts and ploughs are the only implements which have so far been enumerated, as shown below. The statistics for years previous to 1910-11 are not complete It is seen that the number of ploughs rose from 21,444 000 in 1910-11 to 27,571, 000 in 1920 21 and that of the carts from 5,877, 000 to 6,947,000, showing an increase of 28 per cent and 18 per cent respectively.

TABLE.-44.

Growth in the Number of Ploughs and Carts in India
(Number in 1000)

Year	Ploughs	Carts
1884-85 (1)	6,808	1,238
1990-91 (2)	11,453	2,133
1900-01 (3)	13,814	2,872
1910-11	21,444	5,877
1920-21	27,571	6,947

Plantations

In connection with agriculture must also be considered the plantations which produce special commodities, such as coffee, tea and indigo The history of plantations in India dates back to the middle of the 18th century or still earlier, when several British settlers began to grow indigo with the help of Indian labor. In the course of time plantations for the other products grew up in different sections of the country. In 1910-11, there were 1,687 establishments employing 810,407 persons and in 1920-21, there were 2,266 establishments with 820,868 employees.

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(1) Returns of Agricultural Statistics of British India, Calcutta 1886, p 78, excluding Bengal.

(2) Agricultural Statistics of British India, Colcutta, 1892, p. 5, excluding Bengal

(3) Agricultural Statistics of India, Calcutta, 1904, vol. I, p. 235, excluding Bengal

Cultivation.

The gross area cultivated with crops amounted in 1920-21 to 239 million acres in British Provinces and 57 million acres in Indian States, or 296 million acres in all India, counting the areas sown more than once as seperate areas. But the net area actually sown with crops was 212 million acres or 34 per cent of the total area in British Provinces and 54 million acres or 41 per cent of the total in Indian States. Of the gross total area sown in all India, food crops occupied 241 million acres or 81 per cent and non-food crops 55 million acres or 19 per cent. In other words, over four-fifths of the area were devoted to the production of food, as shown in the table below :

TABLE—45.

Area under Different Classes of Crops in India in 1920-21.

Classes of Crops	British Provinces		Indian States		All India	
	acreage (1000)	per cent of total	acreage (1000)	per cent of total	acreage (1000)	per cent of total
Food grains	18[illegible],890	78 2	41,61[illegible]	73 3	228 5[illegible]3	77 1
Fruits and Vegetables	5,172	2 2	410	7	5 582	1 8
Sugar	2 7·6	1 1	151	·3	2 [illegible]87	9
Other food crops	2 438	1.1	[illegible]	[illegible]	4 159	1·4
Total food crops	197,200	82 6	43 [illegible]23	77 3	241,12[illegible]	81·4
Fibre crop	17 316	7 2	5 201	9 2	22 517	7 6
Oil Seeds	12 [illegible]70	5 2	4,11[illegible]	7 4	16,5[illegible]9	5 6
Fodder crops	8 108	3·4	2,[illegible]4	3 7	10 232	3·5
Other non-food crops	3,[illegible]58	1 6	1,3[illegible]4	2 4	5 242	1 7
Total non-food crops	41,652	17 4	12 [illegible]65	22 7	54 720	18·5

Chief among the food grains are rice, wheat, barley, jawar, bajra, ragi, maize and gram. They together with minor food grains occupy 77 per cent of the total area. The statistics for fruits and vegetables are not complete. A large amount raised in orchards and kitchen gardens is scarcely recorded. Of the non-food crops, fibres, especially cotton and jute, are the most important. They occupy about 7 6 per cent of the total area. The oil seeds chiefly consists of linseed, sesamem and rape and mustard. These together with some minor crops are cultivated on 5 6 per cent of the area. Among the fodder crops are included only those which are used exclusively as fodder in normal times. They are oats, field vetch, guinea grass, lucerne, fodder jawar and carob or locust trees. The total area under fodder amounted to 3 5 per cent of the whole area in 1920-21. Among other non-food crops, opium, coffee, tea,tobacco and other drugs and narcotics are the chief.

The relative importance of the staple crops is indicated by the respective areas devoted to their cultivation. In the last 28 years there has been a slight variation in the area, as shown in the table below. It is seen that as far as the amount of land devoted to their cultivation is concerned, rice is by far the most important crop, occupying 78 million acres, and is followed by jawar, wheat, cotton and bajra, occupying respectively 23, 20, 14 and 12 million acres.

During the last 28 years, there has been a decrease in the areas devoted to the cultivation of wheat, bajra, gram, rape and mustard, and an increase in the areas devoted to the remaining crops. The largest increase has taken place in the case of cotton amounting to 38 per cent and the largest decrease in the case of rape and mustard amounting to 37 per cent.

Table—46.

Variation in Areas of Chief Crops in British India.

(Millions of Acres) (1).

Crops	1892-93 (2)	1900-01	1910-11	1920-21	per cent of increase or decrease compared with 1892-93.
Rice	65 7	69 0	78.5	78.1	18
Wheat	21 4	20.0	24.3	20 3	—5
Jawar	21 3	22 0	21.1	22.6	6
Bajra	12.5	15.0	15.5	12.0	—4
Barley	4 6	7.5	7.8	6.2	32
Maize	5.4	5.8	6 3	6 2	14
Ragi	3 6	3 6	4 2	4.2	16
Gram	10.4	10.9	13.9	9 4	—10
Sugar	2 8	2.6	2.5	2.7	—3
Cotton	8.9	9.6	14.4	14.1	58
Jute	2.1	2.1	2.8	2.4	14
Sesamem	2 5(3)	4.0	4 2	3 5	40
Rape & Mustard	...	4.0	3.8	2 9	—37 (4)
Linseed	3 1	2.0	2 5	1.4	—12 1

Both in areas devoted to cultivation and in yields, some of the crops raised in India play an important role in the world's agriculture. Of these crops, rice, wheat, cotton, barley, maize, jute, rapeseeds, linseed tea, tobacco and wool are the chief.

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(1) Agricultural Statistics of India, Calautta 1922 and preceding years.

(2) Agricultural Statistics of India, Calcutta, 1906 p p 8-9 No reliable figures are available for most of the items before the year 1892-93

(3) Excluding Bengal.

(4) In comparison with the year 1900-01

*India is by far the largest rice growing country in the world.Of 49. 8 million hectars devoted to the cul*tivation of rice in 1921-22, 33 million hectars were in India producing 519.9 million quintals(1) of rice out of the world's production of 804.2 million quintals, as shown in the table below. It is seen that the area under rice in India amounted to 66 per cent of the total and the crops produced to 64 per cent of the total.

Table—47.

Rice Production in the World, 1921-22. (2)

County	Area		Yield	
	millions of hectars	Per cent of total	millions of quintals	Per cent of total
India	33 0	66	519.9	64
Japan	3.1	6	99.7	12
Indo-China	4.8	9 6	58.2	7.2
Corea	...	...	27 6	3.4
Philippines	1.6	3	18-0	2.2
Other countries	...	...	80 8	11.2
Total	49 8	100	804·2	100

Wheat is the most important food crop in the world and to its cultivation, 87.5 million hectars of area were devoted in 1922-23 with an yeild of 850·8 million quintals. In India, it coverd 11.4 million hectars, i. e, 13 per cent of the total area and yielded 99 7 million quintals, that is, 11·7 per cent of the total crop. The United States cultivated 24·7 million hectars of land and produced 233 million quintals of wheat or 28 per cent of the total area and 27 per cent of the total crop and stood first in both area and yield. India was second in area and third in yield, as shown below :

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(1) Quintal = 100 kilograms.

(2) The Statistics for this and the following tables have been mostly based on the reports of the International Agricultural Institute at Rome

TABLE—48.

Wheat Production in the World in 1922-23.

Country	Area		Yield	
	millions of hectars	per cent of total	millions of quintals	per cent of total
United States...	24.7	28.2	233.0	27.3
India (British)...	11.4	13	99.7	11.7
Canada ...	9.0	10.3	108.8	12.7
Russia ...	6.7	7.6	43.1	5
Argentine ...	6 4	7 3	51.4	6
France ...	5.2	5.9	66.2	7.7
Italy ...	4.6	5.2	43.9	5.1
Spain ...	4 1	4.6	34 1	4
Australia ...	4 0	4 5	29.1	3.4

Next to wheat, cotton is the most important crop In 1922-23, it covered a total area of 23·9 million hectars in different parts of the world, which yielded 35 million quintals of crop. Of these, India cultivated 8·5 million hectars and produced 26·3 million quintals as against 13·4 million acres of area and 60·3 million quintals of crop in the United States. Both in area and yield India stood second in the world, as shown in the table below :

TABLE—49.

Cotton Production in the World, 1922-23.

Country	Area		Yield	
	millions of hectars	per cent of total	millions of quintals	per cent of total
United States	13.4	55·9	21·6	60·3
India (British)	8·5	35·8	9·4	26·3
Egypt	.8	3·2	2·2	6·2
Brazil	·6	2·6	1·2	3·4
Other Countries	·6	2·6	1·4	3·8
Total	23.9	100	35.8	100

Barley is another important crop among the food grains of the world, and covered 23 million hectars of area and yielded 263·6 million quintals of products in 1922-23. In India, it occupied 2·9 million hectars of area and yielded 31·7 million quintals of products. Both in area and yield, India stood second as against Russia with 3 million hectars of area and the United States with 405 million quintals of crop.

TABLE—50.

Barley Production in the World, 1922-23.

Country	Area		Yield	
	millions of hectars	per cent of total	millions of quintals	per cent of total
Russia	3 0	13	24·3	9·2
United States	2 9	12 6	40·5	15·3
India	2 9	12 6	31 7	12
Roumania	1·7	7 3	20·4	7·7
Spain	1·6	6 9	16 0	6 0
Germany	1 1	4·7	16 0	6·0
Japan	1 1	4·7	18·9	7·1
Poland	1 1	4·7	12 9	4·8
Other Countries	7 6	33	82 9	31·4
Total	23	100	263·6	100

Maize is another important cerial occupying a large area of the world's arable land. In 1921-22, an area of 61 1 million hectars was devoted to its cultivation and 1 070 5 million quintals of crops were produced. The United States is by far the largest maize producing country in the world, cultivating 41.9 million hectars of land or 68.5 per cent of the total area and producing 779.4 million quintals of crop or 72.8 per cent of the total crop. In India, 4 million hectars of land were cultivated and 2.2 million quintals of crop produced, as shown in the table below :

TABLE—51.

Maize Production in the World, 1921-22.

Country	Area		Yield	
	millions of hectars	per cent of total	millions of quintals	per cent of total
United States	41 9	68 5	779 4	72.8
Roumania	3 4	5.5	28.1	2.6
India	2.5	4.0	24.4	2.2
Spain	1 8	2.9	18.7	1.7
Italy	1.5	2 4	23.4	2,1
Other Countries	10.0	16 3	196.5	18 3
Total	61.1	100	1,070 5	100

Linseed is one of the most important oil-seeds, occupying 4 million hectars of the arable land of the world in 1922-23 including Russia. The total production was 21 9 million quintals. Argentine with an area of 1 6 million hectars and production of 11·2 million quintals led the world and was followed by India with an area of 1·2 million hectars and a production of 4·4 million quintals, that is, 50 and 20 per cent of the world's total respectively, as shown in the table below :

TABLE—52.

Linseed Production in the World, 1922-23.

Countr	Area		Yield	
	millions of hectars	per cent of total	millions of quintals	per cent of total
Argentine	1·6	40	11·2	50
India	1·2	30	4·4	20
United States	·5	12·5	3·1	14·1
Russia	·7	17·5	2·0	9·1
Canada	·2	5·5	1·2	5·4
Total	4	100	21·9	100

In the production of some crops, India holds the practical monopoly of the world. Thus in the year 1922-23, of the world's production of 7·6 million quintals of jute, India produced 7·5 million quintals or 98·6 per cent, as shown in the following table :

TABLE—53.

Jute Production in the World, 1922-23.

Country	Area		Yield	
	millions of hectars	per cent of total	millions of quintals	per cent of total
India	·5	83·3	7·5	98·6
Other Countries(1)	·1	16·7	·1	1·4
Total	·6	100	7·6	100

(1) Formosa, Indo-China, Japan and Nepal.

Similarly, of the world's production of 13·7 million quintals of rape and mustard, India produced 11·6 million quintals, i. e., 84·6 per cent, as shown in the table below :

TABLE—54.

Production of Rape and Mustard in the World, 1922-23.

Country	Area		Yield	
	millions of hectars	per cent of total	millions of hectars	per cent of total
India	2·4	89·2	11.6	84·6
Other Countries	.3	10·8	2·2	15·4
Total	2·7	100	13.7	100

To the production of tea also, India contributes the largest share. In 1921-22, the total production of the world amounted to 278.5 million kilograms and of these, India produced 124.4 million kilograms or 44.6 per cent and Ceylon 73.5 million kilograms or 26 per cent, as shown in the table below:

Table—55.

Tea Production in the World, 1921-22.

Country	Area 1000 hectars	Yield millions of kilograms	 Per cent of total
India	286.9	124.4	44.9
Ceylon	169.2	73.4	26.3
Java & Sumatra	91.4	28.8	10.3
Jepan	46 6	33-6	12.0
Formosa	35.9	10-5	3.7
Total	Incomplete	278 5	100

Tobacco is also one of the most important crops of the world, the estimated production of which amounts to 4,500 pounds a year on the average. Of these, India produces about 1,000 million pounds or 22 per cent, and is followed by China raising 500 million pounds or 11 per cent a year. The remaining portion is produced by other countries as shown in the table below.

Table.—56.

Tabacco Production in the world.
(annual averages)

Country	Million of pounds	Per cent of total
India	1.000	22 2
China	500	11.1
Russia	255	5 6
Dutch East Indies	200	4 4
Austria Hungary	170	3.7
Japan	120	2.6
Philippines	100	2 2
Brazil	100	2.2
Other countries	2 055	45 5
Total	4050	100

Inspite of the fact that India has one of the largest flocks of sheep in the world, the production of wool is rather insignificant in comparison with that of other countries. In 1922-3,the estimated production of wool in the world amounted to 2,684 million pounds. Of these, Australia alone produced 618 million pounds or 23 per cent, the United States 261 million pounds or 9·7 per cent and Argentine 231 million pounds or 8.6 per cent of the total, these countries standing first, second and third respectively India produced 60 million pounds or 2.2 per cent and stood eleventh among the principal countries, as shown in the table below.

Table—57

Wool production in the world, 1922-23.

Country	Millions of pounds	Per cent of total
Australia	618	23·0
United States	261	9·7
Argentine	231	8·6
South Africa	187	6·9
New Zealand	175	6·4
Spain	165	6·1
Russia	150	5·5
British Isles	103	3·8
Uruguy	80	2·9
China	61	2·2
India	60	2·2
Other countries	593	22·0
Total	2·684	100

Some of the important crops of the world are not represented in India, such as rye and oats. Their places are taken by bajra, ragi and gram,—crops which are very little known outside India. Potatoes are not grown in India to the same extent as in some countries of Europe and America. They are mostly garden crops in India and statistics are not available on their production.

Some idea of the progress of agricultural production during the past 30 years may be had from the growth of a few chief crops, such as rice, wheat, jute, cotton, oilseeds and tea, as shown in the table below. It is seen that there has been an increase varying from 30 per cent to 158 per cent, leading to a total productivity of 120 per cent for all the crops. The table also shows the fluctuations in the yield of different crops. The yield of jute, for instance, rose to 163 per cent in the first twenty years and then fell down to 30 per cent during the following eleven years. The total decreased by 50 per cent.

TABLE—58

Growth of Agricultural Production

Year	Rice		Wheat		Jute		Cotton	
	millions of tons	Index number	millions of tons	Index number	millions of bales	index number	millions of bales	Index number
1890-91	15.7	100	6	100	3	100	1.7	100
1900-01	20.6	131	7	116	6.5	216	3.0	166
1910-11	28.8	183	10	166	7.9	263	3.9	229
1920-21	27.6	175	6.7	111	5.9	196	3.6	211
1921-22	33.0	210	9.8	163	3.9	130	4.4	258

TABLE—58 (continued)

in India, 1890-91 to 1921-22.

Oilseeds		Tea		Total Productivity	
millions of tons	index number	millions of pounds	index number	mean average of units	index number
1.2	100	124	100	151.6	100
1.7	141	150	120	188.8	124
2.3	191	197	158	250	160
2.3	191	345	278	391	250
2.0	166	274	220	327	210

5. Manufacture.

In ancient times India made considerable progress in manufacture inspite of the fact that she was, and still is, pre-eminently an agricultural country. Until the middle of the 18th century, she not only supplied limited demand of her people for manufactured goods, but also had a large export trade. With the begining of the 19th century, the industrial organisation underwent complete change under the rule of the East India Company. Manufacture declined and agriculture became the main support of the artisan classes. Within the last two generations, there has been a growing tendency in India for modern industries. The factory system has been established and domestic manufactures are again finding their place in the foreign market.

Handicrafts.

The handicraft system is, however, still more important than the factory system in India. The chief handicrafts are weaving, pottery-making carpentry, smithing, oil-pressing, masonry, tailoring and shoe-making. Among the artistic crafts are to be classed such works as those in wood, clay, stone, metal and textile.

Industrialism.

The essential feature of modern industrialism is the factory system which has been well-established in India. Other modern industries also have made rapid progreess. In 1911, there were in the whole of India 7,113 large scale industries employing 2,105,624 persons. In 1920-21, the number of industries rose to 15,600 and that of the employees to 2,601,000 But including all classes of workers, such as those in transport, the industrial population of India was 8,000,000 in 1920-21.

From the view-point of industrial population, India stands very high among modern advanced countries, as shown in the table below. It is seen that the industrial population of India in 1921-22 amounted to 8 millions as against 13 millions of the United Kingdom and 12 millions of Germany. Taking the industrial population of the United Kingdom, which is most advanced in manufacture, as base, the index number for India as well as that for France stood at 61·5 as against 91·6 for Germany. The list excludes the United States which is a highly industrial country and also Russia for which no recent statistics are available. India can, however, claim the fifth place among the industrial nations.

In proportion to her vast population, the number of workers who find occupation in modern industries in India is, however, very insignificant, amounting to 1.5 per cent as against 27·6 per cent in the United Kingdom and 25 per cent in Switzerland. India is, therefore, still in the rudimentary stage of industrial development

TABLE—39.

Industrial Population in Chief Countries in 1922.

Country	Industrial population (millions)	Index number	per cent of total population
United Kingdom	13	100	27·6
Germany	12	91·6	20
France	8	61·5	20·4
India	8	61·5	1·5
Italy	5·47	42	14·1
Japan	5	38·4	8·8
Tchecho-Slovakia	2·5	19·2	19·2
Poland	2·1	16·1	8·0
Belgium	1·36	10·4	18·2
Spain	1·3	10	6·1
Canada	1·25	9·6	14·1
Switzerland	1·0	9·2	25

The Joint Stock Companies.

One of the most important features of modern industrial organisation is the rise of corporate enterprise, which is represented in India by the joint stock companies. They indicate the industrial growth of the country, especially regarding factories and other large scale industries.

The Joint Stock Companies Act was passed as early as 1882 and amended in 1913. The total number of companies limited by shares and incorporated in India under the laws relating to the registration of companies was 8887 up to the year 1919-20. Of these only 3,668, or 41 per cent, were working at the end of that year with a total paid-up capital of 123 crores of rupees.

The growth of the joint stock companies within the last 30 years is shown in the table below. It is seen that they have increased in number from 1309 in 1895-96 to 4283 in 1920-21 and in the amount of paid-up capital from 24 crores in 1890-91 to 158 crores in 1920-21, showing an increase of 227 and 558 per cent respectively. It is also seen that the amount of capital for each company increased from 2.6 lakhs to 3.6 in 20 years. This is due partly to the lower purchasing power of the rupee, partly to the facilities for raising capital and partly to the need of increasingly larger capital for modern business enterprise.

TABLE—60

Growth of Joint Stock Companies registered in India.

Year	Companies at work		Paid up capital		per company in lakhs of rupees.
	Number	per cent of increase compared with 1195-96.	Amount in crores.	per cent of increase compared with 1890-91	
1890-91	1309[1]	—	21	—	—
1900-91	1366	4	36	50	2.6
1910-11	2304	76	69	187	2.9
1920-21	4283	227	158	558	3.6

Beside the above companies registered in India, there were also in 1920-21, 643 companies with a paid-up capital of 495 million pounds, which were registered abroad but did business in India.

The largest number of companies registered in India were formed for trading purposes and amounted to 1834 in number or 42 8 per cent of the total,

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(1) For 1895-96.

and had a paid up capital of 59·7 crores of rupees or 37.7 per cent of the total, as shown in the table below. The trading companies were followed by banking, loan and insurance companies, which numbered 741 or 17.3 per cent of the total and had a paid up capital of 19.5 crores of rupees or 12.3 per cent of the total. The number of companies for textile industries amounted to 469 or 10.9 per cent of the total, but had a paid capital of 40.7 crores of rupees or 25 per cent of the total. Other important joint stock companies were formed for such industries as plantation and mining.

TABLE—61

Chief Classes of Joint Stock Companies in British India in 1920-21.

Classes	Companies		Paid up Capital	
	Number	per cent of total	Amount in crores	per cent of total
Trading	1834	42.8	59.7	37.7
Banking, Loan & Insurance	741	17.3	19.5	12.3
Textile	469	10.9	40.7	25.7
Plantations	464	10.8	8.6	5.4
Mining	356	8.3	16.4	10.4
Others	419	9.8	13	8.2
Total	4283	100	158	100

Factories.

A factory in India is any premise using power-driven machinery and employing 20 persons or more according to the Factory Act of 1922. No reliable data regarding the number of factories are available prior to the year 1892, when the first statistics were gathered, and 653 factories were found to exist in the whole country. The gradual growth in number of factories and of employees is shown below. It is seen that in 30 years from 1892 to 1921, the number of factories increased from 653 in 1892 to 3957 in 1921 and that of employees from 316,715 to 1,263, 658, i. e., 506 and 299 per cent respectively During the same period the number of employees per factory decreased from 485 to 319. This reduction is due to the inclusion of smaller establishments within the jurisdiction of the factory Act.

TABLE—62.

Growth of the Factory System in India.

Year	Number of factories		Number of persons employed		
	Total	Per cent of increase compared with 1892	Total	Per cent of increase compared with 1892	Average number of persons per factory.
1892	653	———	316,715	——	485
1900	1207	85	468,956	48	388
1910	2271	248	792,511	150	349
1920	3726	470	1,231,725	288	332
1921	3957	506	1,263,658	298	319

The importance of India's factory system becomes evident by comparing her factories with those in other countries like Japan, and the United States. In 1919, Japan had, for instance, 23,831 factories employing 1,390,941 persons(1) and the United States 290,105 modern industrial plants employing 9,096,372 persons, (2) as shown below It is seen also that of the three countries, India had the largest number of employees per establishment or factory, that is, 369 as against Japan having 58 and the United States having 31. This is due to the fact that more small industrial plants are included within the jurisdiction of the factory law in Japan and the United States than in India.

TABLE—63.

Factories in India as compared with those in Japan and the United States.

Country	Year	Number of factories	Number of persons employed	Average number of persons per factory
India	1921	3,957		
Japan	1919	23,831	1,263,658	369
United			1,390,942	58
States	1919	290,105	9,096,372	31

The cotton industry is the most important of manufacturing industries in India. The spinning and weaving of cotton had been known to the people of India for centuries, but it was not until 1851 that Bombay started its cotton mills. In a decade about a dozen mills sprang up round about the city. In 1878-79, there were 58 mills with an authorised capital of 5,62 crores of rupees and 80,000 pounds, 12,983 looms and 1,436,464 spindles. In the year 1920, the number of mills rose to 278, that of looms to 117,900 and that of spindles to 6,652,000 and the amount of authorised capital to 56,24 crores. The growth of the cotton industry from 1879-80 to 1920 is shown below. It is seen that taking the average of the quinquennium from 1879-80 to 1883-84 as base, the number of mills has increased by 341 per cent, that of looms by 713 per cent and that of spindles by 313 per cent and the amount of authorised capital by 764 per cent.

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(1) Employing more than 10 persons Statesman's Year Book, 1923, p. 1697.

(2) World's Almanac, New York, 1924, p 336.

TABLE—64

Growth of the Cotton Industry in India.

Year	Mills		Looms		Spindles		Authorised Capital	
	Actual number	Index number	Actual number (1000)	Index No.	Actual Number (1000)	Index No.	Amount (Crores)	Index Number
1178-79	58	—	12.6	—	1,430	—	5.6	—
Quinquennial averages ending								
1883-84	63	100	14.5	100	1,610.6	100	6.5	100
1888-89	93	148	18.2	126	2,296.8	143	8.8	135
1893-94	127	202	25.3	175	3,263.8	203	11.6	177
1898-99	156	248	36.6	253	4,046.1	251	14.1	216
1903-04	195	310	42.0	290	5,000.9	310	16.8	257
1908-09	218	346	60.0	414	5,549.1	345	18.7	286
1913-14	257	408	88.1	608	6,406.4	398	22.4	341
1918-19	265	421	110.7	763	6,629.8	412	24.1	368
1920-21	278	441	11.7	813	6,652	413	56.2	864

In manufacturing cotton, India occupies an important place in the world's industry, as indicated by her possession of spindles and looms and by the consumption of cotton in her mills. In the year 1920, there were 154 million spindles in the world, of which 134 millions were active. Great Britain led the manufacturing countries and possessed 56 million spindles or more than one-third of the total and was followed by the United States with 37 million spindles. In the possession of looms, Great Britain and the United States similarly took the first and second places having respectively 790,000 and 729,000 looms. India possessed 6.8 million spindles and 119,000 looms, i e, 4.5 and 4.2 per cent of the total respectively and stood sixth and seventh among the nations. During the same year, the total consumption of cotton in the world amounted to 9,322 million bales, of which India used 945 or one-tenth of the total and stood fourth in the list, as shown in the table below

TABLE—65.

Cotton Industry in the World in 1920. (1)

Country	Spindles (total number in millions)	Spindles active on Dec. 31, 1920	Looms (1000)	Consumption of cotton in bales (1000)
Great Britain	56.4	51.3	790	1,247
United States	36.8	36.0	729	3,003
France	9.6	7.6	180	326
Germany	9.4	9.1	190	514
Russia	7.1	.5	91	367
India	6.8	5.6	119	945
Japan	4.4	3.0	50	1,019
Italy	4.5	4.1	140	336
Tcheco-Slovakia	3.5	3.0	138	158
China	2.2	......	7.6	5 2
Other countries	13.2	13.5	379.4	1075
Total	153.9	133.7	2,184	9,322

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(1) Annuaire Generale de la France et de L' Etrange, 1923, p 5

Next in importance is the manufacture of jute, fabrics of which had long formed the rough clothing of the poor. In 1854, spinning machinery were brought from Dundee and the first jute factory was established at Serampore. The growth of the jute industry in the quinquennial averages from 1879-80 to 1918-1919 and in annual for 1920-21 is shown in the table below. Taking the quinquennial average for 1879-80 to 1883-84 as base, it is seen that in 1920-21 the number of mills increased by 257 per cent, that of looms by 634 per cent and that of spindles by 888 per cent and the amount of authorised capital by 569 per cent.

TABLE—66.

Growth of the Jute Industry in India

Year	Mills		Looms		Spindles		Authorised Capital	
Quinquennial average ending	actual number	index number	actual number (1000)	index number	actual number (1000)	index number	amount (crores)	index number
1883-84	21	100	5·5	100	88	100	2·7	100
1888-89	24	114	7	127	138·4	157	3·4	126
1893-94	26	124	8·3	151	172·6	196	4·0	149
1898-99	31	148	11·7	213	244·8	278	5·2	193
1903-04	36	171	16·2	295	334·6	380	6·8	251
1908-09	46	219	24·8	451	510·5	580	9·6	355
1913-14	60	286	33·5	609	691·8	786	12·0	443
1918-19	73	348	39·7	722	821·2	933	14·0	519
1920-21	75	357	41·5	754	869·8	988	18·0	669

The third in the series of the textile industries is woolen manufacture, which has met with little success against foreign competition. Rugs, carpets and shawls are still made with hand looms in workshops, but their annual output is considerable. In 1905, there were 6 mills with 715 looms and 27,387 spindles. In 1919, the number of mills rose to 7, that of looms to 1, 385 and that of spindles to 47,020. Only five factories made a report of their authorised capital, which rose from ·46 crore of rupees in 1905 to 2.81 crores in 1909

Next to the manufacture of textile goods is the iron and steel industry. Only two decades ago, the production of iron and steel was insignificant, but since the beginning of the Great War, it has become one of the most promising industries of the country. While several old companies have been revived, the Tata Iron and Steel company, a new organisation, has become one of the largest concerns in the world.

The production of iron and steel during the last few years is shown in the table below. It is seen that the prodction of pig iron rose from 244,700 tons in 1916 to 366,600 in 1922, showing an increase of 49 per cent But at the same time, the production of steel slightly fell from 114,000 tons in 1917 to 111,500 in 1922, i. e., decreased by 2 5 per cent.

TABLE—37

Production of Iron and Steel in India.

(in 1000 long tons)

Year	Pig Iron	Steel
1916	244.7	
1917	218.1	114
1918	247.1	130
1919	317.3	134
1920	311.2	113.2
1921	367.9	125.3
1922	366.9	115

In comparison with other countries, India's production of iron and steel is almost insignificant, as shown in the table below. It is seen that the world's production of pig iron and steel amounted to 59.8 millions and 56.6 million tons respectively in 1920 and 1919. Of these, the United States alone produced 37.5 million tons of the former and 35.2 million tons of the latter, i.e., 62.7 and 62.5 per cent respectively. India produced only .31 million tons of pig iron and .12 million tons of steel, i. e., .5 and 2 per cent respectively.

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(1) J C Brown, India's Mineral Wealth, London, 1923, p 60
The Mineral Industry during 1921, New York, 1922, p 386

TABLE—68

World's production of Pig Iron and Steel in 1920(1)

Country	Pig Iron		Steel	
	Quantity (million metric tons)	per cent of total	Quantity (million metric tons).	Per cent of total
United States	37·1	62.7	35·2	62 5
United Kingdom	8·1	13·5	9·2	14·3
Germany	5·5	9·1	8	12·1
France	3·4	5·6	6·8	3·8
Belgium	1·1	1·8	2 1	—
Canada	·98	1·5	—	—
Austria Hungary[2]	·80	1 3	·9	·2
Sweden	·47	·7	·8	·7
Japan	·37	·6	—	1·7
India	·31	·5	·12	·2
Other countries	1 15	1·9	——	
Total	59·8	100	56 6	100

Of the other branches of manufacture deserving mention, paper making and brewing are the chief. The paper industry started successfully, but as soon as wood pulp was introduced into foregn countries, the progress in India was checked. Brewing started over half a century ago and is still maintaining its existence. Of the seasonal industries, cotton ginning, cotton and jute pressing and rice milling are the chief. They vary in number and importance from year to year according to the annual production of crops

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(1) The Mineral Industry in 1921, New York, 1922, p p. 368.
(2) Including Czecho-Slovakia

The factories and other large scale industries in British India may be divided into the classes enumerated in the following table. It is seen that the largest number of establishments are those relating to cotton ginning and pressing. But as far as the number of persons employed is concerned, cotton and jute industries are the most important. In 1921-22, 285 cotton factories employed 307,000 persons and 76 jute mills 276,000 persons They were followed by cotton gins and presses and railway and tramway workshops, employing 141,000 and 130,000 persons respectively. The total number of establishments was 5312 and the number of persons employed, 1,367,000.

TABLE—69

Large Scale Industries in British India in 1921-22 (1).

Classes of Industry	Number of establishments	Number of persons employed.
Cotton spinning & weaving	285	307,000
Jute mills	76	276,000
Cotton gins and presses	1940	141,000
Railway & tramway workshops	98	130,000
Engineering workshops	219	57,000
Rice mills	609	49,000
Jute presses	211	33,000
Minting presses	158	33,000
Tile & brick works	256	28,000
Dockyard & port trust workshops	16	26,000
Iron and steel works	1	21,000
Tannery and leather works	107	17,000
Saw mills	144	15,000
Petroleum refineries	8	13,000
Stone works	62	13,000
Wooden mills	30	11,900
Sugar factories	55	11,600
Other industries	1047	184,500
Total	5312	1,367,000

Outturn

It is hard to estimate the products of manufacturing industries in India. Most of them are produced by handicrafts and consumed locally. The most important handicraft products are the cotton goods, a rough estimate of which may be made in the way shown in the table below. It is seen that by subtracting the yarn exported or re-exported from the total quantity of the domestic and imported yarn, we find the quantity of yarn consumed by both handlooms and mills in India. Since the quantity of the yarn consumed by the mills is known, that consumed by the handlooms is found by mere subtraction. At the rate of 4 yards of cloth per pound of yarn, the amount of cloth woven by the handlooms is calculated in the last column. It is seen that the amount of handicraft production of cotton cloth has increased from 748 million yards in 1896 97 to 1176 million yards in 1920-21.

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(1) Statesman's Year Book, 1924, p 146

TABLE—70

Growth of the Handloom Cloth in British India (1)

(Yarn in million pounds)

Year	Produced in country	Imported	Exports or re-exports	Consumption in mills	Consumption in handlooms	Yards of hand loom cloth in millons.
1896-97	423.1	45.6	199.6	82.9	187.2	748
1900-01	352.9	30.0	122.1	98.7	162.0	648
1909-10	627.3	31.6	233.0	228	199	796
1920-21(2)	660.0	47.3	82.8	330	294	1176

One of the important features of the cotton industry is that the domestic products of cotton fabrics are growing more rapidly than their imports This is clearly seen in the case of grey and bleached goods, as shown in the table below. It is seen that while the amount of the products in Indian mills rose from 319.5 million yards in 1900-01 to

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(1) Indian Trade Journal, April 10, 1911, p 73.
(2) Indian Industries and labour, Bulletin 16, 1921, p 3

871 million yards in 1915-16, i.e, from 19.3 per cent of the imported goods, to 42·8 per cent, the increase jumped into 1076·3 million yards in 1919-20, i.e., 125·8 per cent of the imported goods. This phenomenal increase is partly due to the fall of of imports as the results of the general depression of business and banking in Europe arising from the after-effect of the Great War, but is also partly due to the increasing capacity of Indian mills.

TABLE—71

Growth of Domestic Cotton Goods as compared with those imported

Year Averaging five years ending	Imported goods (millions of yards)	Goods produced at home	
		amount (millions of yards)	per cent of imported
1900-01	1654·2	319·5	19·3
1905-06	1741·6	457·4	26·3
1910-11	1749·4	676·2	39·2
1915-16	2032·8	871·0	42·8
1919-20	855·4	1076·3	125·8

Some idea of the pogress of the manufacturing industries in India may be had from the increase in the products of cotton and jute industries, as shown below. It is seen that the amount of yarn grew, although not without some fluctuation, from 432 million pounds in 1895-96 to 621 million pounds in 1920-21 and that of woven goods from 83 million pounds in 1896-97 to 339 million pounds in 1920-21, showing an increase of 43 and 300 per cent respecttively. The products of jute industries increased much more rapidly as shown in the volume of their exports. The number of gunny bags rose from 99 millions in 1890-91 to 534 millions in 1920-21 and the amount of gunny cloth, from 30 million yards to 1352 million yards during the same period, showing an increase of 439 and 4406 per cent respectively. The growth of the total productivity of the manufacturing industries as represented by these four items is shown in the last two columns. Taking as base the figures for 1900-01, for which complete data are available, it is seen that the productivity increased by 178 per cent in twenty years.

TABLE—72

Growth of Manufacturing Production in India (1)

Year	COTTON				JUTE				Total productivity	
	Yarn		Woven goods		Gunny bags[2]		Gunny cloth			
	Millions of pounds	Index No.	Millions of pounds	Index No.	Millions	Index number	Millions of yards	Index number	Mean average of units	Index number
1890-91	432[3]	100	83[4]	100	99	100	30	100	...	...
1900-01	353	81	99	119	203	205	365	1219	255	100
1910-11	610	141	245	295	361	364	955	3116	543	213
1920-21	621	143	339	400	534	539	1352	4566	711	278

(1) There are discrepancies between this and the last table due to the different sources of information.
(2) Representing export trade only.
(3) For 1895-96 only
(4) For 1896-97.

Transport.

Transportation is the key to the modern industrial organisation. The most important systems of transportation are roads, railways, tramways and waterways. To these must also be added such other means of communication as post, telegraph, telephone, radiograph and airship.

Roads.

Road-building was a common custom with Hindu princes even before the Christian era. But it received a new impetus under Mahommedan rulers. Many trunk roads like those between Bengal and the Punjab were built during the Mahommedan period. Metalled roads for heavy draft were not, however, constructed until within recent years. In 1850, there were only a few miles of metalled roads in the whole country, and since then there has been a gradual, though slow, increase in milage of both metalled and unmetalled roads, as shown below. It is seen that metalled roads increased from 38,089 miles in 1900-01 to 55,456 miles in 1920-21 and the unmetalled roads, from 133,808 miles to 148,456 miles, thus leading to a total increase from 176,897 miles to 204,344 miles of both metalled and unmetalled roads. In 1920-21, there were also 4328 miles of bridle paths and 1911 miles of fair weather and temporary roads.

TABLE—73

Growth in the Milage of Roads in India.

Year	Metalled roads	Unmetalled roads	Total roads.
1900-01	38,089	133,808	176,897
1910-11	55,233	136,000	191,233
1920-21	55,456	148,884	204,340

(1) Annuaire Statistique, Paris, 1923, pp. 299-301.

Railways.

The work of railway construction began in India in 1853 with a capital outlay of 3.7 crores of rupees. In 1863, 2,507 miles of railways were built at the total outlay of 53 crores. They have since then steadily increased and the milage opened for traffic amounted to 37,029 miles in 1920-21. Of these, 18,195 miles were of the standard gauge (5 1/2), 15,248 miles of the metre gauge (3-3/8) and 3,586 miles of other gauges (21/2 and 2 ft.)

The gradual growth in the milage and the capital outlay of the railway system in India is shown in the table below. It is seen that during the last 48 years the milage increased from 5,697 miles to 37,029 and the capital outlay increased from 91.7 crores to 626.8 crores, that is to say sevenfold in each case. On the other hand, the gross earnings also increased from 7.2 crores to 91.9 crores, that is, about thirteen fold.

TABLE—74

Growth of Railways in India.

Year	Number of miles open for traffic	Total capital outlay (crores of rupees)	Gross earnings (crores of rupees.)
1873	5,697	91.7	7.2
1883	10,450	148.3	16.3
1893	18,465	232.6	24.0
1900	24,713	329.6	31.5
1910	32,099	439.0	51.1
1920-21	37,029	626.8	91·9

Inspite of the increase of the milage, the Indian railways fall far short of satisfying the needs of modern life, which depends so much upon transportation systems. This is very well seen by comparing the railways of India with those of other countries, as shown in the table below:

TABLE—75

Railways in Principal Countries. (1)

Country	Year	Total length in kilometres	Length per 10,000 inhabitants	Length per 100 Sq. kilometres
United States	1921	422,437	39·4	5·4
Russian Empire	1921	64,902	4·9	·31
Canada	1919	62,603	61·3	·51
India	1922	59,859	1·86	1·27
German Empire	1920	57,935	9·4	11·6
France	1911	51,128	12·9	9·5
Australia	1920	42,185	76·4	·55
Argentine	1915	34,534	42·1	1·08
Great Britain	1921	32,660	7·6	14·2
Brazil	1921	28,733	9·3	·34
Italy	1918	19,043	4·9	6·1
Spain	1920	15,250	7·1	3·0
Japan	1921	13,640	2.44	2·5
China	1920	10,973	......	·10
Belgium	1919	8,657	11·7	30·0
Hungary	1922	7,230	8·9	7·6
Austria	1921	6,879	10·6	8·2

The above table shows that in the years between 1919 and 1922, the United States had by far the largest railway line in the world, which amounted to 422,437 kilometres. Amongst the other large railway systems were those of the Russian Empire, Canada and India, amounting respectively to 64,902, 62,603 and 59,859 kilmetres. According to area, Balgium, however, led the world, having 30 kilometres of railway per 100 square kilometres and was followed by Great Britain, Germany and France having respectively 14.2, 11.6 and 9.5 kilometres. But from the viewpoint of population, the most advanced countries were Australia, Canada and Argentine, occupying the first three places with the respective lengths of 76.4, 61.3 and 42.1 kilometres per 10,000 inhabitants. It must, however, be remembered that a new and extensive country with a sparse population and modern civilisation is likely to have a larger railway line than a densely populated country. If the population be increased two or three times in such a country, there would scarcely be a proportionate increase in the railway line. These countries should, therefore, be excluded for the purpose of comparsion. Among the large and populous coqutries, the United States had 39.4 kilometres per 10,000 inhabitants and France, Belgium and Australia had respectively 12.9, 11.7 and 10.6 kilometres. India stood last in the list with the exception of China, and had only 1.86 kilometres of railway per 10,000 inhabitants

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(1) Annuaire Statisque, Paris, 1923, p p. 299-301.

The relative position of India with regard to the railway transportation becomes still more clear by a study of the traffic in the chief countries, excluding Germany for which the records are not available, as shown in the table below. It is seen that the largest number of passengers travelled on the railways of Great Britain and the United States, amounting respectively to 1591 and 1085 millions. India stood fourth in the list with 460 million passengers. But from the viewpoint of the number of times each inhabitant travelled, Australia took the lead with a record of each passenger travelling 51 times and was followed by Great Britain with a record of 33 times. India with a record of 1.4 times stood last in the list with the exception of China and Russia. Taking into consideration the freight carried by each railway system, the United States took the lead both in the total and per capita amounts of freight which were 2,306 million tons and 22 tons respectively. The per capita amount of freight in India was only .3 ton and excepting that of China, was the lowest as compared with the countries mentioned in the list, It is worth while to remember that the railway traffic is generally supplemented by those of tramways, subways, elevated railways steamers and motors or wagons. The addition of these traffics will make some decided change in the relative positions of these countries.

TABLE—76

Railway Traffic in Chief Countries.

Country	Year	Passengers carried		Tons of freight	
		Millions	Number of times each person travelled	Total (million tons)	Per capital tons
United States	1918	1,085	10.3	2,306	22
United Kingdom	1916	1,591	33.0	416	8.9
France	1913	548	14.2	229	6.0
Russia	1911	216	1.2	288	1.6
Japan	1918	245	4.5	55	.9
Canada	1918	51	5.8	128	14.7
Australia	1916	275	50.9	31	5.7
Argentina	1918	59	6.8	41	4.7
China	1918	25	.08	20	.06
India	1919	460	1.4	102	.3

Waterways

Waterways are still the cheapest and one of the most important means of transportation. There are several great rivers in India, but they are not evenly distributed. The rivers in western and southern India are few in number and mostly unfit for navigation. Whatever small navigation is being carried on in the Indus at present will come to an end as soon as the Punjab and Sind canal is opened for irrigation. Bengal, Assam, Bihar and Orissa are traversed by several large rivers, which still form the high ways of commerce in the North-eastern India.

Besides, there are innumerable small rivers, tributaries, creeks and backwaters which are fully utilised by small crafts. Rain in summer turns the whole of lower Bengal and several other districts of India into a vast mass of water, making navigation easy and cheap.

The navigable canals in India are insignificant. In several provinces, some of the large irrigation canals are used for navigation purposes. In 1920-21, there were opened 1,471 miles of canals on which plied 204,593 vessels carrying 2,389,927 passengers and 14,499,339 tons of cargo.

The most important waterway for international trade is the sea, which surrounds India practically on three sides But the coasts of India are low and sandy and deficient in good harbours. With the exception of river mouths, there are scarcely any openings into the land. The only chief ports of India are Karachi, Bombay, Tuticorin, Madras, Calcutta and Rangoon.

Merchant shipping is practically undeveloped in India Indian shipping took an important part in foreign trade during ancient and medieval times, but has declined under British rule Thus in 1922-23, including vessels of 100 tons or more, India together with Ceylon had only 230,883 tons of merchant shipping. The relative position of India in the merchant shipping of the world is shown in the table below. It is seen that in 1922-23, India and Ceylon had only ·23 million tons of merchant shipping i. e., ·3 per cent of the total shipping of the world as against 19·2 million tons of Great Britain and 16·9 million tons of the united States, i. e., 29 per cent and 25 per cent of the world's shipping respectively.

TABLE—77

Merchant Shipping in Chief Countries in 1922-23.

Country	Vessels	Tonnage	
		millions	per cent of total
Great Britain	8,694	19.2	29.0
United States	5,416	16·9	26.0
France	2,021	3·7	5.7
Japan	2,003	3·6	5.5
Italy	1,415	3,0	4.6
Holland	1,114	2,6	4.0
Germany	1,843	2,59	3,9
Norway	1,800	2,55	3,8
India (2)	212	.23	.3
China	157	.22	.3

Owing to the inadequacy of the merchant marine, the shipping trade of India is almost entirely in the hands of foreigners, especially the British. Thus of the total volume of 15,473,221 tons of shipping including vessels entering and those clearing at the ports in 1920-21, only 190,035 tons or 1.2 per cent were native, 12,072,403 tons or 78 per cent British or British Indian and the remaining 3,210,783 tons or 20,7 per cent belonged to other European and non-European countries.

(1) Including Philippine Islands.
(2) Including Ceylon.

Post Office.

One of the most important means of communication in modern times is the postal service. It is, therefore, logically connected with the transportation system. Its main business is the conveyance and delivery of letters, post cards, newspapers, parcels book packets. To these have also been added such other functions as the remittance of money, establishments and maintenance of savings banks and selling of bonds.

It was in 1837 that a public post was first established in India. The organisation of the present postal system did not begin, however, until 1854. In 1876 India became a member of the Universal Postal Union. The function of the post office has since then gradually widened.

In 1860-61, there were in British India only 889 post offices carrying 48.4 millions of articles exclusive of money orders. The progress of the postal service during the past fifty years, i e, from 1870-71 to 1920-21, is seen in the table below. It is seen that the number of post offices increased from 2,736 to 19,496 and the milage of mail line from 52,000 to 158,000[1] and the amount of revenue, from 81,2 lakhs of rupees to 535.6 lakhs. In the year 1920-21, the personnel of the post office numbered 102,885, of whom 8404 were village postmen.

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(1) In 1910-11, *i e*, 40 years only.

TABLE—78

Growth of Postal Service in India.

Year	Offices	Miles of mail line, land and sea (1000)	Revenue (lakhs of rupees.)
1870-71	2,736	52	81.2
1880-81	5,264	91	86.8
1890-91	9,419	109	136 2
1900-01	12,419	132	198 8
1910-11	18,813	158	229,5
1920-21	19,496	...	535 6

Inspite of its progress, the post office in India is quite inadequate to serve the varied interests of modern industrial and intellectual life, This becomes clearer when the Indian postal system is compared with that in other countries, as shown in the table below. It is seen that in 1921 for every 13 square kilometres, there was one post office in Germany and Great Britain, while in Russia, there was one post office for every 1174 square kilometres. It must be remembered that large parts of Russia are uninhabited. The same is true of the United Stats In India each post office had an average of 93 square kilometres within jurisdiction. As far as the number of post offices in proportion to the population is concerned, Germany stand first. There is one post office for every 1700 people. India stands last in the list with one post office for every 12,800 persons of the population. The number of letters and cards per inhabitant was also the lowest in India amounting to 5 as against 89 in the case of the United States and 79 in the case of Great Britain.

Table—79

Postal Systems in Principal Countries.

Country	Year	Offices (1000)	Area for each office (square kilo)	Inhabitants for each office (1000)	Letters and cards per inhabitant
United States	1921	55.2	184	2.1	89 (1)
Great Britain	1921	23·8	13	2.0	79
Germany	1921	12.5	13	1.7	57
France and Algeria	1914	15 7	36	2 6	40
Belgium	1921	1 8	18	4 3	43
Hungary	1921	2.4	41	3.5	17
Italy	1920	12.0	25	3 1	16
Spain	1921	9.5	58	2.4	12
Russia	1915	19.1	1174	9.6	12
Japan	1920	8 9	56	7.3	54
India	1921	19.4	93	12 8	5

Telegraphs

One of the quickest means of communication is telegraph, which, has rapidly increased in India as in other countries. In 1851-52 there were only 82 miles of line with the same milage of wire and cable, which have steadily increased in each succeeding decade. The progress of the telegraph system during the past 50 years is shown below. It is seen that the milage of the line increased from 13,500 to 91,700 and that of the wire and cable from 22,800 to 412,000 and the amount of revenue from 12·9 lakhs to 350 50 lakhs, thus showing an advance amounting to 579, 1701 and 2613 per cent respectively.

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(1) For 1917.

TABLE—80

Growth of the Telegraph System in India

Year	Number of miles of lines (1000)	Number of miles of wire and cable (1000)	Revenue (lakhs of Rupees)
1870-71	13·5	22·8	12·0
1880-81	20·3	56·0	45·0
1890-91	37·0	113·7	68·28
1900-01	55·0	182·1	114·98
1910-11	74·8	292·0	128·0
1920-21	91·7	412·0	350·50

The relative position of India in the development of the telegraph system is shown below. It is seen that in the milage of lines, the United States, Russia and Germany occupy the first three places with 215,500,153,100 and 118,100 miles respectively. India with 87,800 miles stands fifth in the list. But as far as the number of messages per person is concerned, India occupies the last place, having only 06 messages as against 3.2 of Australia and 1.7 of Canada. The details on these points are lacking in the case of Russia and China.

TABLE—81

Telegraphs in Chief Countries (1919-21)

Country	Miles of the line (1000)	Telegrams sent	
		Total number (millions)	Per capita number
United States	245·5	167	1·5
Russia	153·1	——	——
Germany	148·1	75·8	1·3
France	120·[illegible]	64·3	1·7
India	87·8	20·6	·06
United Kingdom	81.1	66·7	1·4
Australia	61·8	17·1	3·2
Canada	52·6	11·9	1·7
China	42	——	——
Italy	35	20	·5
Japan	27·6	60	1·1

Telephone.

With respect to telephone service, India is still in the infant stage of development. The telephone system is partly in the hands of the Government and partly in the hands of private companies in such important cities as Calcutta, Madras, Bombay and Ahmedabad. In 1921-22, there were 10 telephone exchanges with 23,958 connections established by private companies and 255 exchanges with 11,988 connections established by the Government. In the same year, there were 22 wireless Government stations. Only four of these were open to the public for transmission of messages.

The telephone system in India as compared with that in other countries is shown in the table below.

It is seen that the United States and Canada lead other countries in the number of telephones having respectively 13.1 and 10.2 per every 100 inhabitants. They are followed by Denmark, Sweden and other smaller countries. India had only .01 telephone for every 100 persons.

TABLE—82

Telephone in Chief Countries.

Country	Telephones.	
	Number (1000)	Per 100 inhabitants.
United States	14,496	13.1
Canada	902	10.2
Denmark	270	8.2
Sweden	385	6.2
Norway	152	5.7
Australia	240	4.4
Switzerland	162	4.2
Germany	1,945	3.3
Great Britain	998	2.1
Austria	132	2.1
France	513	1.3
Belgium	80	1.1
Japan	425	.8
Italy	120	.3
India	36	.01

The latest means of communication, such as radiograph, which has been successfully introduced even in a backword country like China, and air service, which has been introduced in many Western countries, are practically unknown to India.

The progress of the transportation system during the past forty years is shown in the table below.

It is seen that the railway production increased by 322 per cent in the case of passengers and 235 per cent in the case of freight, and the foreign shipping increased by 106 per cent. During the same time, the postal service increased by 435 per cent in the value of the money orders issued and by 329 per cent in the number of articles carried, and the number of paid telegrams increased by 505 per cent. The total production of the transport system showed an increase of 323 per cent.

TABLE—83

Growth of Transportation in India.

Year	Railways				Foreign Shipping		Post office				Telegrams		Total transportation	
	Passengers		Goods				Value of the money order issued		Articles carried					
	No. in millions	Per cent of increase compared with 1890-91	Millions of tons	Per cent of increase compared with 1890-91	Millions of tons	Per cent of increase compared with 1890-91	Amount in crores of rupees	Per cent of increase compared with 1890-91	No. in millions	Per cent of increase compared with 1890-91	No. in millions	Per cent of increase compared with 1890-91	Mean average of the units	Per cent of increase compared with 1890-91
1890-91	135.5	—	28.8	. . .	6.6	.. ...	16.0	..	317.0	.. ..	3.4	—	84.8	.. ..
1900-01	170.3	.. ..	42.8	45	7.0	6	26.8	67	522.2	65	6.4	88	131.9	55
1910-11	371.5	174	65.6	127	12.7	77	42.8	167	941.1	197	13.0	282	184.9	118
1920-21	572.9	322	95.5	235	13.6	109	85.7	435	1360.0	329	20.6	505	359.0	323

7. Banking

Banks in India may be divided into three groups: general banks including industrial and mortgage banks, postal savings banks and co-operative banks.

Of the general banks, the following are the chief: First, the Imperial Bank comprising the banks of Bengal, Bombay and Madras. They were originally the Presidency Banks and were recently combined into the Imperial Bank. Their business is confined to fixed territories. Beside undertaking ordinary banking activities as regulated by banking laws, they act as banker to Government. Second, the Exchange Banks with head offices abroad. Some of them were established half a century ago. The business of these banks is twofold: transaction of exchange business between India and foreign countries and ordinary banking activities like that of the Imperial Bank. In 1920, there were 15 exchange banks in India with a number of branches. Third, Indian Joint Stock Banks, which with the exception of a few have been organised within the last two decades. They are registered under the Indian Companies Act and, unlike the exchange banks, have their head offices in India. They are subdivided into two classes. First, those with a paid up capital and reserve of Rs. 5 lakhs or more. Second, those with a paid up capital and reserve amounting to any sum between one lakh and less than 5 lakhs. Statistics are taken only of those banks which have a minimum paid up capital and reserve of one lakh of rupees. In 1919, for instance, there were altogether 95 banks and 230 branches and agencies, but in the statistics for that year were included only 47 banks and 224 branches. There is no land mortgage bank or industrial bank in India in the proper sense of the word.

The growth of general banking in India is shown in the table below. It is seen that the capital and reserves of all classes of banks comprising Presidency Banks, exchange banks and joint-stock banks, rose from 5.9 crores of rupees in 1871 to 108.7 crores in 1920-21. But excluding the capital and reserves of the exchange banks, which are outside India, the amount inside India rose from 3.7 crores to 18.4 crores in 1920-21, showing an increase of 497 per cent in 50 years. During the same period, the amount of deposits rose from 12.4 crores of rupees to 232.9 crores and that of cash balance from 10.6 crores to 67.5 crores, showing an increase of 1768 and 537 per cent respectively.

TABLE—84

Growth of General Banking in India.

Year	Capital and Reserve			Deposits		Cash Balance	
	Of all banks (1) (crores of rupees)	Of only Presidency and Joint stock banks		Amount (crores of rupees)	Index number	Amount (crores of rupees)	Index number
		Amount (crores of Rs)	Index number				
1870	5.9	3.7	100	12.4	100	10.6	100
1880	7.3	4.3	116	15.4	123	9.3	88
1890	13.0	5.0	135	28.5	229	16.0	150
1900	22.6	6.8	183	34.2	274	8.6	81
1910	42.2	10.6	286	87.2	697	18.5	174
1920	108.7	18.4	497	232.9	1868	67.5	637

(1) Including exchange banks with capital and reserve outside India. The Capital and reserve of those banks have been changed into rupees at the rate of 10 rupees to the pound.

Postal Savings Banks.

The first government savings bank was established in Calcutta in 1833 and was followed by similar banks in other Presidency towns. In 1870, district savings banks were also instituted in connection with district treasuries. It was in 1882 that the postal savings banks were opened all over the country. The district savings banks were transferred to the postal savings banks in 1886 and the Presidency savings banks were closed in 1896. The administration of Postal Savings banks is within the jurisdiction of the Post Office Department. The Government regards the deposits as unfunded debts and there are no specific reserves against them. The postal savings banks offer an opportunity mostly to the urban population The maximum amount receivable for deposit is Rs 5,000 and the rate of interest is 3 per cent.

The growth of Postal Savings Banks is shown in the table below. Taking the quinquennial averages from 1882-83 to 1886-87 as base, it is seen that in 1920 21 the number of depositors increased from 196,000 to 1878,000 or 858 per cent and the amount of desosits from 3·0 crores of rupees to 18 8 crores or 515 per cent, that of the withdrawals from 2 5 crores to 17.3 crores or 571 per cent and that of the balance of deposits from 4·3 crores to 22·8 crores or 426 per cent. It is also seen that at the outbreak of the war, the amount of withdrawals increased from 9 crores to 17 8 crores and per capita deposit fell from 141 to 91 rupees. In 1920-21, the per capita deposit was 121 rupees.

TABLE—85

Growth of Postal Savings Banks in India.

Year	Depositors		Deposits inclusive of Interests.		Withdrawals		Balance of deposits inclusive of interests.		
	No (1000)	Index No	Amount (crores of rupees)	Index No	Amount (crores of rupees)	Index No.	Amount (crores of rupees)	Index No	Per capita
Quinquennial Average from 1882-83 to 1886-87	196	100	3·0	100	2·5	100	4·3	100	……
1900-01	816	416	3·9	130	3·5	135	10.0	231	123
1910-11	1430	723	6·5	216	5·4	211	16·9	389	118
1913-14	1639	836	11·6	386	9·0	350	23.1	533	141
1914-15	1644	838	9·6	320	17·8	693	14·8	341	91
1920-21	1878	958	18·8	615	17·3	671	22·8	526	121

Co-operative Credit banking.

Co-operative credit societies were instituted in India by an Act in 1904 in order to "encourage thrift, self-help and co-operation among agriculturists, artisans and persons of limited means." The underlying aim, was to induce deposits from the non-agricultural population, such as money-lenders, merchants and the professional classes, to supplement the finance of the agricultural population. They are divided into two classes, namely, agricultural and non-agricultural, according as members of one class do or do not preponderate over members of the other class to the extent of four-fifths of its membership. Each society consists of ten or more members above the age of eighteen residing in the same locality, who by combining to furnish a collective guarantee, can obtain loans at a lower rate of interest than they could obtain individually. The local societies in a district are federated into central or district banks. There may be combinations in smaller areas also.

The progress of co-operative credit banks has been most rapid in the history of Indian banking, as shown below. It is seen that taking four years' average from 1906-07 to 1909-10, as base, the number of societies rose from 1,900 to 43,300 in 1920, and that of the members from 161,900 to 1,736,900, showing respectively an increase of 2178 and 983 per cent. During the same period the amount of working capital increased from ·68 crores of rupees to 21.4 crores or 3047 per cent.

TABLE—86

Growth of Co-operative Credit Banking in India.

Year	Societies		Members		Working Capital	
	Number absolute (1000)	Index number	Absolute number (1000)	Index number	Amount (crores of rupees)	Index number
Averages 1906-07 to 1909-10	1.9	100	161.9	100	68	100
1910-11 to 1914-15	11 7	615	548.2	338	5 4	794
1915-16 to 1919-20	28.4	1420	1129.7	696	15 1	2220
year 1920-21	43.3	2278	1757	1083	21 4 (1)	3147

(1) For 1919-20.

In recent years, the banking system in such European countries as France, Italy and Belgium, has undergone much deterioration, while in other countries, such as Austria, Germany and Russia, it has completely broken down. Accurate data for comparative study is not therefore available. It is still possible to have some rough idea of the relative banking position of some of the countries. In comparison with other countries, India is in a very low stage of development in banking business, as shown in the table below. India, for example, with a population three times as much as that of the United States, had in 1922 only 11,292 banks including branches and agencies, 1,339 million rupees, or 416 3 million dollars of capital including that of the exchange banks outside India and 2,318 million rupees or 772.6 million dollars of deposits as against the United States having 30,460 banks and branches exclusive of savings banks, 3006 million dollars of capital and 37,785 million dollars of deposits The relative position of India's banking becomes still more striking when her capital and deposit in proportion to population are compared with those of other countries The per capita capital and deposit in India amounted to only Rs. 4.2 or $ 1.4 and Rs. 7.2 or $ 2.1 respectively as against, for example, $28.6 capital and $35 deposits in the United States,

TABLE—87
Banking in Principal Countries (1)

Country	Year	Number of Banks (including branches)	Capital and Rest		eposits (banks and savings banks)	
			Total amount in millions	Per capita amount [2]	Total amount in millions	Per capita amount[2]
United States	1922	30,460 (3)	$ 3006	28.6	37,785	350
U. Kingdom	1923	—	£ 174	3.7	2,690	57.2
France	Feb-1924	2,358	Fr.262	7.0	2,697	68.4
Italy	1922	—	Lire 392	10.1	60,485	1558.9
Belgium	1921	—	Fr. 100	14.8	1,495	197
Japan	1919	6,641	yen 1,575	26.2	9,777	162.6
Canada	1922	5,775	$255	29.3	4,248	488.2
Australia	1921-22	—	£ 50	9.2	451	83.3
Holland	1922	—	Guilders 26	3.8	538	79.1
Union of S. Africa	1922	—	£ 23	3.4	179	25.2
India	1922	11,292	Rs 1339	4.2	2,318	7.2

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(1) Compiled by the Commercial Intelligence Department of India, Calcutta Owing to wide fluctuations in international exchange rates, no attempt has been made to change the currencies of different countries into one uniform standard.

(2) Populations repesent those of the last census, and no correction has been made.

(3) Excluding savings banks. (4) Including copital and reserve of exchange banks outside India.

Some rough idea of the progress of banking business in India may be had from the growth of the capital and reserve and the deposits of all classes of banking, as shown in the table below. The capital and reserve of the exchange banks outside India have been omitted.

It is seen that the mean average of the units have grown from 12.5 in 1890 to 97·5 in 1920, showing an increase of 680 per cent in the total banking business of the country during the 30 years under consideration,

TABLE—88

Growth of Banking Business in India,
(Crores of rupees)

Year	Capital and Reserve	Deposit			Total productivity	
	Presidency and Joint stock Banks only	Co-operative Credit Banks	All general banks	Postal savings banks	Mean average of units	Index number
1890	5.0	--	28.5	3.9	12.5	100
1900	6.8	—	34.2	3.9	26.6	212
1910	10.6	2.0	87.2	6.5	35.4	283
1920	18.4	21.4	233.9	18.8	97.5	780

8. Commerce.

Exchange economy is the most important feature of the modern industrial organisation. This is very clearly seen in the growth of commerce all over the world. As in other countries, there has been in India a gradual growth of trade, which may be conveniently grouped under four heads, namely, inland trade, coasting trade, frontier trade, and sea borne trade.

Inland Trade.

One of the most interesting records of Indian commerce is that relating to inland trade, giving some idea as to the extent of the movement of the staple articles of both imports and exports from one part of the country to another. It shows the final destination of imports and the original locality of exports. There is a good deal of variation from year to year in the movement of these goods as it depends upon the outturn of crops which are largely determined by climatic conditions. The first data on inland trade carried by rail and rivers were collected in 1884-85. The total imports and exports of merchandise amounted to 68 million tons in 1920 -21.

Coasting Trade.

A considerable trade is also carried on between the ports of Indian States, French possessions, and British Provinces. The most important of such trade is that between India proper and Burma. In 1920-21, the coasting trade amounted in value to 209 crores of rupees, including 113 crores of rupees in imports and 96 crores of rupees in exports as against the pre-war average of 110 crores and the war average of 123 crores.

Frontier Trade.

The land frontier of India extends over 6800 miles, but the value of the trade across the frontier is on the average about five per cent of the sea borne trade. Of the frontier countries trading with India, Nepal, Tibet and Afganistan are the chief. In 1921-22, the total trade amounted in value to 30 crores of rupees as against the pre-war average of 18.7 crores and the war average of 25 crores.

Sea-Borne Trade.

The internal domestic trade excepted, the most important trade of India is the sea-borne trade. Within the last 85 years, there has been a steady increase in the sea-borne trade varying from 27 to 134 per cent each decade, as shown in the table below. It is seen that during the period under consideration, the imports increased in value from 6.15 crores of rupees to 381.90 crores, the exports from 8.19 crores to 293.81 crores and the total trade from 14.34 crores to 675 crores, showing an increase of 47 times in the value of the total trade. This valuation, however, needs correction Taking the value of 39 articles of export and import commodities in 1873 as base, the index of commodities rose to 23.6 in 1920-21, or in other words, the real value of the sea-borne trade rose to 286 crores as against 675.7 crores of the nominal value.

TABLE—89

Growth of the Sea-borne Trade in India.

(including merchandise and treasure)
(in crores of rupees)

Year	Imports	Exports	Total trade	p.c. of increase in each decade	Balance of trade
1734-35	6.15	8.19	14 34	—	2.04
Decennial averages ending					
1844-45	9.72	13.74	23 46	63	4.02
1854-55	14 06	18 76	32 82	39	4.02
1864-65	37.43	39 44	76 87	134	2.01
1874-75	44.75	56 61	101.40	31	11 82
1884-85	57.54	74.50	132.04	30	16.96
1894-95	83.27	102 66	185 93	40	19.39
1904-05	105.71	130 96	236.67	27	25.25
1914-15	179.72	205.27	384.99	62	25.55
Year 1920-21	381 90	293.81	675 71	47	88.09

Balance of Trade.

One of the important features of India's foreign trade is favourable balance. For about three-fourths of a century this balance had been in her favour, varying from 2.04 crores of rupees in 1834-35 to 25.5 crores in 1914-15 and even after, as shown in the last column of the table above. In the year 1920-21, the balance was, however, reversed against her amounting to 88 09 crores of rupees The favourable balance was usually liquidated in England by the payment of "home charges" and interests on debts.

Countries trading with India.

The relative positions of the countries trading with India are to be seen in the analysis of her sea-borne trade for 1921-22, as given below. It is seen that India's three largest cumstomers are the United Kingdom, Japan and the United States, buying respectively 20,15 and 10 per cent of her commodities. Similarly the three most important countries from which India imports are the United Kingdom, Japan and the United States, selling respectively 56, 8, and 5 per cents in value of goods. The other important trading countries are Java, Germany, China, Belgium, Australia, Ceylon, and France.

TABLE—90

Share of Chief Countries in India's Trade in 1921-22

Country	Imports p. c. of total	Exports p. c of total	Total trade p. c. of total
United Kingdom	56.6	20.1	38.35
Japan	5.1	15 7	10,40
United States	8 1	10.0	9.05
Java	8 9	1.7	5 3
Germany	2.7	6 7	4 7
China	1 0	4.5	2 75
Belgium	2.1	3 3	2 7
Australia	3.5	1 6	2.55
Ceylon	5	5 0	2.5
France	.8	4.0	2 4
Straits Settlements	1.5	3.1	2.2
Other countries	9.2	24 3	16.75
Total	100	100	100

By far the largest part of India's trade is transacted with the United Kingdom. This is partly due to difference in geographical situation and industrial development between the two countries. But the essential cause is the political domination which has given England virtual control of India's resources and industries

There has been, however, a great deal of variation in India's trade with the United Kingdom. While both exports and imports have increased absolutely, they have decreased relatively. Thus the import trade increased from 32 2 crores of rupees in 1875-76 to 151 crores in 1921-21 and the export trade from 28 crores to 49 crores, but the percentages of the imports and exports as compared with the totals fell respectively from 83 per cent to 56 per cent and from 19 per cent to 20 per cent, as shown below.

TABLE—91

Variation in India's Trade with the United Kingdom. (Decennial averages in crores of rupees)

Year	Total Imports	Imports from U. K		Total exports	Exports to U. K.	
		Value	Per cent of total		Value	Per cent of total
1875-76	38 9	32.2	83	58	28	49
Decennial averages ending						
1884-85	46·2	37·9	82	72	31·1	43
1894-95	67·9	51·8	76	99	34·9	35
1904-05	82·2	56·4	69	121	34·3	28
1914-15	139 8	91·7	65	197	51·1	27
Year 1921-22	266	151	56	245	49	20

Nature of Trade.

Exports mainly comprise food stuffs and raw materials and imports, manufactured articles This is clearly seen in the analysis of the sea-borne trade for the year 1921-22, as given in the table below. It is seen that the most important articles of imports are manufactured cotton goods amounting to 21 per cent of the total import trade in value and are followed by machinery amounting to 13 per cent. The other important articles are sugar, iron and steel and railway plants. The exports consist chiefly of jute and jute manufactures and cotton and cotton manufactures amounting respectively to 24 and 19 per cent of the total export trade. Hides and skins, food grains, oil seeds and tea are chief among the other articles of exports

TABLE—92

Chief Articles of India's Sea-borne Trade in 1921-22.

Imports		Exports	
Classes of articles	Percentage of total value	Classes of articles	percentage of total value
Cotton manufactures	21	Jute & Jute manufactures	24
Machinery	13	Cotton & Cotton manufactures	19
Sugar	10	Hides & skins	12
Iron and Steel	8	Seeds	8
Railway plants	7	Tea	7
Mineral oil	3	Food grains	5
Hardware	2	Other articles	25
Silk	2		
Other articles	34		
Total	100	Total	100

A still more clear conception of the nature of India's foreign trade may be had from the export and import of the merchandise classified under four heads : First, food, drink and tobacco. Second, raw material and produce mainly manufactured. Third, articles wholly or mainly manufactured. Fourth, miscellaneous and unclassified articles. The relative importance of these four classes of goods in the import and export trade of India is seen in the table below. It is seen that 71 per cent of the articles imported were wholly or mainly manufactured as against 26 per cent which were exported. At the same time India exported 48 per cent of her raw materials as against 8 per cent which she imported. The import and export of food, drink and tobacco almost balance each other.

TABLE-193

Classes of Merchandise in India's Foreign Trade in 1921-22.

Classes	Imports		Exports	
	Value in crores of rupees	p.c of total	Value in crores of rupees	p.c. of total
1. Food, drink and tobacco	50.62	19	53.51	23
2. Raw materials and produce mainly unmanufactured	22.01	8	111.55	48
3. Articles wholly or mainly manufactured	189.37	71	61.66	26
4. Miscellaneous and unclassified articles.	4.32	2	46.4	3
Total	266.3	100	231·40	100

The more significant point in the analysis of the trade of India is the relative increase in the export of manufactures and decrease in that of raw materials In 1913-14, that is, the year before the outbreak of the war, the export of manufactured goods formed 22.4 per cent of the total exports in value and in 1921-22, it rose to 36 per pent. Similarly, the export of raw materials formed 50 per cent of the total export in 1913-14 and fell to 43.4 per cent in 1920-21.

A review of the export and import trades of important countries during the year 1921-22 would bring out the relative commercial position of India. It must however, be remembered that the breakdown of the industrial organisation of Central Europe, of which Germany was the backbone, renders the comparison somewhat misleading. It is still possible to have some idea of the position of India in international trade.

The table below would show that in 1921-22 the United Kingdom stood first in both imports and exports, the value of which were respectively 1004 and 824 million pounds, thus having a total trade of 1828 million pounds. The United States and France stood second and third with a total trade of the 1375 and 578 million pounds respectively. India ranked fourth in import, export and total trade.

From the viewpoint of per capita trade, the Netherlands, however, leads the countries of the world having 39.7 pounds as against the United Kingdom standing second with a per capita trade of 38.6 pounds. The per capita trade of India with the exception of that of China is the lowest and amounted to only 1.7 pounds.

The amount of the trade of a people does not necessarily signify their prosperity. A small country with a large population and specialised industries, such as England and Belgium, is bound to have more per capita trade than a large country like the United States which has vast territories, diversified industries and well developed internal trade.

TABLE—94

Commerce of Various Countries in 1922.

(Excluding specie and bullion)

(in millions of pounds)

Country	Imports	Exports	Total trade	Per capita trade £ in
United Kingdom	1008·9	824·2	1828·1	38·6
United States	521·6	754·2	1375·8	13·0
France	310·3	268·0	578·3	14·7
India	297·5	284.4	564·9	1·7
Japan	185·9	159·4	345·3	6·1
Czecho-Slovakia	140·2	170·7	310·9	22·8
China	179·1	118·8	297·9	·9
Netherlands	168·8	101·7	270·5	39·7
Argentine	125·7	133·0	258·7	30·0
Italy	163·5	80·4	243·9	6·2
Germany	124·5	112·4	236·9	3·9
Belgium	114·2	83·4	197·6	27·2

Some idea of the commercial progress of India may be had from the growth of the inland, coasting, and sea-borne trades within the past thirty years, as shown in the table below. It is seen that the inland trade has increased by 228 per cent, the coasting trade by 228 per cent and the sea-borne trade by 232 per cent, thus leading to a general increase of 238 per cent.

TABLE—95

Commercial Progress in India,

Year	Inland trade (export & import)		Coasting trade		Sea-borne trade (export & import of merchandise and treasures)		Total trade	
	cwt, in millions	p.c. of increase compared with 1890-91	Value (crores of Rs.)	p.c. of increase compared with 1890-91	Crores of rupees	p.c. of increase compared with 1890-91	Mean average of units	p.c. of increase compared with 1890-91
1890-91	414	—	66	—	193	—	224	—
1900-01	646	56	84	27	208	7	313	39
1910-11	1070	158	105	59	386	100	520	132
1920-21	1360	228	217	228	641	232	757	238

CHAPTER IV.

PRODUCTIVITY.

In the foregoing chapters have been described the chief resources of India as compared with those of other countries as well as the principal industries through which they are utilised. The products of various industries have been discussed, both absolutely and relatively and their effect on the people noted. Now it remains to summarise the results with a view to determining the productivity of the country and indicating the prosperity of the people.

As noted before, national productivity may be determined in several ways. First, the quantitative and qualitative growth of products. Second, the present condition of production in a country as compared with that in other countries. Third, the comparative thoroughness with which the resources are utilised and wastage avoided. Fourth, the relative prosperity of the people.

1. Growth.

This is an age of rapid industrial development. Discoveries and inventions are bringing about changes in industrial art, leading to the enormous growth of production in almost all countries. How far India has kept pace with other countries in industrial progress as indicated by the quantitative and qualitative growth of products is hard to determine for lack of complete and comparable statistics.

Although it is not possible to have any accurate knowledge of relative productivity, a rough idea may be had of the absolute growth of production in India during the past 30 years from a few fragmentary data on some of the industries. It must, however, be remembered that such calculation becomes accurate only when a large number of the products of representative industries are taken into consideration. But in the present study, the number of products being very small, the index of productivity leads only to a tentative rather than a final conclusion.

The growth of the total productivity may be estimated from the productivity of different industries discussed before. Leaving out of consideration the fishing industry, for which there exist no complete and adequate data, the products of other industries may be estimated as in the following table. Taking the mean averages of the products of several industries for 1890-91 as base, it is seen that the index number rose to 570 in 1920-21. In other words, the total productivity of all industries under consideration increased about 6 times as much in 30 years.

TABLE—96

Growth of Productivity in India.

Year	Forestry	Mining	Agriculture	Manufacture	Transport	Banking	Commerce	Total Productivity	
								Mean average of all units.	Index number
1890-91	69	577	152	65	82	12.5	224	168	100
1900-01	86	1375	189	214	125	26.6	313	332	197
1910-11	121	2730	250	658	222	35.4	520	648	385
1920-21	177	4009	391	943	339	97.5	757	959	570

2. Condition,

In some of the commodities for which there is a world-wide demand, India occupies a very high position. The most important of these are fibre crops, food crops, oil seeds and even some minerals. In 1921-22, India produced 98 6 per cent of jute, 87.6 per cent of rape and mustard, 64 per cent of rice, 59 per cent of manganese ore, 44 per cent of tea, 26 per cent of cotton, 22 per cent of tobacco, 20 per cent of linseed, 12 per cent of wheat, 12 per cent of barley and 9.8 per cent of salt, as shown in the table below. Besides, India stood fourth in international trade in 1920-21.

TABLE—97

India's Share in the World's Production.

Commodity	Year	World's production quantity in millions	Production in India	
			quantity in millions	Percentage of total
Jute	1922	7·6 (quintals)	7·5 (quintals)	98·6
Rape and mustard	1922	13·7 ,,	11·6 ,,	86·6
Rice	1922-23	804 ,,	520 ,,	64·0
Manganese ore	1921	1·1 (tons)	·67 (tons)	59·0
Tea	1922-23	278 (lbs)	124 (lbs)	44·0
Cotton	1922	35·8 (quintals)	9·4 (quintals)	26·3
Tobacco	1922	4500 (lbs)	1000 (lbs)	22·2
Linseed	1922	21·9 (quintals)	4·4 (quintals)	20·0
Barley	1922-23	263·6 ,,	31 ,,	12·0
Wheat	1922-23	906 ,,	99·7 ,,	11·7
Salt	1921	17 (tons)	1·6	9·8

India even possesses a large proportion of a few of the capital goods of the world, as shown in the table below. It is seen that in 1920-21, India had 47 per cent of each of the world's cattle and goats, 8.6 per cent of the sheep, 6 per cent of the horses and mules and ponies, 6 8 per cent of the railways 8 3 per cent of the telegraph wires, 4.4 per cent of the spindles and 4 3 per cent of the looms,

TABLE 98

India and the World's Capital Goods, 1920-21.

Commodity	The World	India	
		Absolute number or amount	Per cent of total
Cattle	376 million heads	177 5 million heads	
Goats	66 " "	31 " "	47
Sheep	393·5 " "	34 " "	47
Horses etc.	73 " "	4 4 " "	8·6
Railways	958000 k. m.	59·859 k. m.	6
Telegraphs	1,057 million	87·8 million k· m.	6·8
	k. m.		8·3
Spindles	153.9 millions	6·8 million	4 4
Looms	2.8 "	119 "	4·3

Inspite of its outstanding position in some of the world's products and even in some of the capital goods, the present status of India as regards productivity is very low. This becomes clearer when her productivity is compared with that of other countries. While it is hard to estimate the efficiency of such industries as manufacture, transport and commerce, agriculture, which is by far the most important industry of India, gives us some basis for calculation.

To the production of such crops as rice, wheat, cotton, barley, maize, jute, linseed, and rape and mustard, India devoted an average of 46.7 per cent of the world's area covered with these crops in 1922-23, but the yield amounted to 39.9 per cent of total production of the world, as shown in the table below. Taking the averages of the yields for these crops as base, it is seen that the index of productivity varied from 55 in the case of maize to 96 in the case of rice. The yield of jute amounted to 118, but it is a crop peculiar to India. The index of yield for all the crops amounted to 85, that is, 15 per cent less than the mean average yield of the world.

TABLE—99

Productivity of Agriculture in India, 1922-23.

Crop	Area	Yield	
	Per cent of the world's total	Percentage of the world's total	Index number with area as base
Wheat	13	11·7	90
Cotton	35·8	26·3	73
Barley	12·6	12	95
Maize	4	2·2	55
Linseed	30	20	66
Jute	83.3	98·6	118
Rape & mustard	89.2	84·6	94
Rice	66 2	64	96
	46·9	39.9	85

The low productivity of Indian agriculture becomes still more evident by comparing its yield with the average yield of crops in all the countries, as shown in the table below. It is seen, for example, that India produces only 8.7 quintals of wheat per hectar as against an average of 9.4 quintals. The same thing is true of the other crops, except jute which was on a par. The mean average of all the crops was 8.4 quintals as against the mean average of 9.5 quintals of all the countries. In other words, India's production was only 88 per cent of the average production of the world.

TABLE—100

Relative Productivity of Agriculture in India.

Crop	Mean average of yield in all countries (quintals)	Yield in India	
		Absolute quantity (quintals)	index number
Wheat	9.4	8.7	92
Barley	11.0	10.9	99
Maize	15.9	9.7	59
Rice	16.2	15.7	96
Rapeseed	5.0	4.7	94
Linseed	4.9	3.6	73
Cotton	1.5	1.1	73
Jute	12.8	12.8	100
Mean average	9.5	8.4	88

In averaging the yields of different crops, all the countries have been taken into consideration, irrespective of the quality of land, and the method of culture. But when compared with the agriculture of advanced countries, the low productivity of Indian agriculture becomes still more clear. The per hectar yield of three principal crops of India as compared with those of rival countries is shown in the following table.

Rice is the most important crop, but its yield per hectar amounted to only 15.7 as against 35.2 quintals of Japan and 59.5 quintals of Spain. Similarly the per hectar yield of wheat was 8.7 quintals in India as against 9.4 in the United States and 12 quintals in Canada and that of cotton 1.1 quintals in India as against 1.6 quintals in the United States and 2.9 quintals in Egypt.

TABLE—101

Per hectar Yield of Rice, Wheat and Cotton in Chief Countries, 1922. (quintals)

Country	Rice	Wheat	Cotton
India	15·7	8·7	1·1
Japan	35·2	15·1	——
United States	20.1	9·4	1·6
Spain	59·5	——	——
Italy	39·1	9·5	——
Egypt	28·7	16·2	2·9
Russia (European)	—	6·4	——
Canada	——	12	——
Germany	——	14·2	——

The relative inefficiency of Indian agriculture as compared with the agriculture of other countries is revealed by the index number of productivity—a method adopted by the U S. Department of Agriculture. Six crops forming the bulk of crop production in most countries, namely, wheat, oats, rye, barley, corn and potatoes were taken into consideration. For each country, the average yields per acre for a series of years were obtained and these averages were reduced to the percentage of averages of all countries. The percentages for each country were combined, weighted in proportion to the relative average of various crops in the country, to obtain the index number of production. The following is the result obtained, 100 representing the weighted average of all countries.

TABLE—102

Agricultural Productivity in Different Countries.[1]

Country	Index number	Country	Index number
Belgium	221	Norway	128
Switzerland	202	France	123
Netherlands	190	Austria	120
United Kingdom	177	Hungary	113
Germany	169	United States	108
Denmark	168	Italy	96
New Zealand	167	Roumania	94
Egypt	161	Spain	93
Japan	137	Bulgaria	87
Canada	136	India	86
China	136	Australia	76
Sweden	136	etc , etc.	

The above table shows that the index of agricultural production in India was 86 which is practically the same as found in the two previous tables, i.e., 85 and 88 or 86·5 on the average. Belgium with the index number of 221 stood highest in the list and India stood twenty-second among the countries. The efficiency of Indian agriculture is lower than that of Canada, Australia and the United States, which are new countries and where the most extensive system of cultivation prevails.

3. Wastage.

Beside insufficient production, wastage is another important feature of the industrial system of India. As shown before, India possesses a considerable amount of mineral, vegetable and animal resources. But the present organisation is scarcely capable of utilising even half of these resources. A few examples will be sufficient to prove this contention.

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[1] Yearbook of the Department of Agriculture, 1919, p 735.

The culturable area in 1920-21 amounted to 480 million acres Thanks to climatic conditions, practically all this area is adaptable to two or even three crops a year. Since some part of this land may not be cultivated more than once, it may be assumed that all the arable area is fit for two crops a year on the average. The potential resources of India's arable land is, therefore, 960 million acres. The actual area cropped in 1920-21 was 296 million acres in all India counting the areas sown more than once as separate areas. In other words, out of a total potential arable area of 960 million acres, only 296 million acres or 31 per cent, were utilised for productive purposes and 664 million acres or 69 per cent, were wasted. Viewed from the standpoint of efficiency, this wastage becomes still larger. India's yield being only 85 per cent of the average yield of the principal countries of the world, the area utilised for cropping becomes 26 per cent instead of 31 per cent as above and the wastage, 74 per cent.

Forest land amounts to about 25,000 square miles or 23 per cent of the total land area. Of this area, a large part is "unclassed forests" containing unoccupied treeless waste. The actual area under forests would not amount to more than 13 per cent, as noted before. In other words, 50 per cent of the forest land is under actual forests. But the area of merchentable forests is still less, amounting to about 40 per cent. Even the marchantable forests are scarcely intensively afforested Inspite of the attempt for the last three or four decades, it has not yet been possible to allow annual cut to exceed one third of the annual growth. Nor has there yet begun any industrial use of forests products. It might be safely said that one half of the forest land is wasted in India.one

The larger part of the fisheries is also wasted. As will be noted presently, only 30 per cent of the fish required for the population supplied at present. That the remaining 70 per cent can be easily supplied from the fresh water and marine fisheries with proper culture and catch cannot be doubted for a moment. Unlike metal, fish resources are perishable and 70 per cent of the fisheries must be regarded as an annual waste.

Of the mineral resources, the most importat loss is that of water power. As noted before, India possesses water resources of 27 million horse power, of which only one-half of one per cent has been utilised for production up to the present time. Thus 99.5 per cent of the water power resources are annually lost to India. The production of iron of which there exists an abundant supply is so meagre that it might also be regarded as lost to India. Through inefficient mining, a large part of coal, mica and other minerals is also wasted.

Along with these main classes of resources are also wasted other resources which might be regarded as their by products. The most important of these are as follows First, edible plants and animals, such as mushrooms, oysters, mussels and frogs. Second, wood for the manufacture of paper, alcohol and other commodities. Third, fruits and flowers for apiculture, i.e., for the production of honey and wax. Fourth, algae and larvae, which grow in plenty under the tropical heat and rainfall and which could be transformed into food by fish and poultry. Fifth, feeds together with labor for boarding the old and useless cattle as well their meat. Speaking very conservatively, about one-sixth of the cattle, numbering 25 million heads, are nothing but "boarders," on vegetable resources and productive energy of the country. Sixth, the export of oil seeds, hides and skins and other raw materials may also be regarded as a sort of wastage of India's resources. Instances like these could be multiplied. In short, India is scarcely conscious of her potential wealth and lacks the necessary efficiency for utilising it for the benefit of her people.

4. Prosperity.

Consumption is the ultimate object of all production. The best method of judging national productivity is to estimate its effect on the material condition of the people, as compared with that in other countries. One of the great achievements of the advanced countries is that they have practically solved the problem of absolute poverty. It is, however, still the greatest problem of India. The majority of the people are insufficiently fed. The comparative supply of food in terms of calories is given in the table below.

TABLE—103

Food Production in Chief Countries, 1911-1913. (1)

[*Estimited average annual production of important food crops, such as maize, wheat, oats, barley, rice, millet, jawar, bajra, gram, potatoes and sugar. The fuel value of ten bushels of wheat is approximately 1,000 000 calories.*]

Country	Total food in 1000 tons	Total Calories in millions	Per capita calories in millions.
Argentine	14,480	45,767,000	6.45
Canada	17,107	50,835,000	6·45
United States	133,411	425,442,000	4.63
Australia	3,557	11,994,000	2·69
German Empire	84,332	143,440,000	2·12
Austria-Hungary	46,468	103,241,000	2·09
Russia Empire	121,600	300,241,000	1·89
France	90,650	70,829,000	1·79
Italy	11,960	34,834,000	1·00
India (British)	59,638	198,133,000	·88
Japan	11,925	37,351,000	·72
United Kingdom	14,040	25,750,000	.56

The above table shows the per capita amount of food produced in different countries. The average amount of food required by an individual per year is about 1,000,000 calories. It is seen that all the countries except the last three produce food sufficient for their inhabitants as far as the caloric value is concerned. Both Argentine and Canada lead other countries, each producing 6.45 million calories

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1. Finch, V. C., and Baker, O. E., Geography of the World's Agriculture. p. 45.

or over six times the amount required by their people. They are followed by the United States and Australia, producing 4·63 and 2·69 million calories respectively. A new country having a comparatively small population and applying the modern technique of production is in a very advantageous position to raise food stuffs and other raw materials. While these advantages cannot be enjoyed by the older and more densely populated countries, there is still a great chance for the production of more food as seen in the case of Austria-Hungary, Germany and France. Germany has the same acreage of per capita land as India, but raises more than twice the amount of food. The reason is that Germany uses more intensive cultivation and raises more food crops of higher caloric value, such as sugar, than India.

The per capita food production in India amounted to 83 million calories, that is, about one-fifth less than what is required for a person. Out of this meagre production, a large part is exported in exchange for other necessaries and for the payment of "home charges." Although some food stuffs are imported, the imports never balance the exports as far as the nutritive value is concerned. The United Kingdom, on the other hand, produces only about half of the food required for its people. She is essentially a manufacturing country and imports, in exchange of her manufactured goods food stuffs for more than six months in the year. But India is mainly an agricultural country and cannot very well import food stuffs in exchange of her manufactures which are scarcely sufficient for her own consumption.

Fish is another important food To a rice-eating people, fish is not a luxury, but an absolute necessity. The present supply is quite inadequate. Allowing 4 oz. of fish per person a day and assuming that a person eats fish 320 days in the year, as suggested by Sir K. G. Gupta concerning the people of Bengal, one needs about one maund of fish a year. But the fish supply to Calcutta in 1919-20 amounted to only 313,000 maunds for a fish-eating population (1) of 900,000, i.e., the supply amounted to about [illegible] seers or a little over one-third of the requirements.

Even the people of England and Wales, to whom fish is only a supplement to the protein diet of meat, eggs, milk and cheese, consume more fish per capita than the people of India. In 1920, for instance, the per capita consumption of fish in England and Wales was 43 lbs. as against 28 lbs. in India.

Next to food, clothing is the most important item of consumption. Owing to warm climate, the clothing used in India is mostly made of cotton. But the consumption of cotton cloth in India is far below than that in most of the countries, as shown in the table below.

Although the figures refer to the pre-war period, they do not fail to convey a clear idea of the condition. It is seen that excepting China and Russia, the consumption of cotton cloth in India was the lowest among the countries mentioned in the list and amounted to only 4 lbs. per head as against 17.7 lbs. in the United States and 10 lbs in Belgium. When it is considered that most of the countries including China and Russia use woolen clothing in addition, the cousumption of clothing in India becomes still more insignificant.

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1 Vide Supra also of Bulletin 5. Bengal, Behar and Orissa Fisheries Department The annual output of Calcutta has been estimated to be about 26 per cent of the requirements.

TABLE—104

Consumption of Cotton Piece Goods in Various Countries.

(Annual average, 1910-13) (1)

Countries	Population in millions 1910.	Cotton piece goods consumption	
		Total (million lbs.)	Per capital (lbs)
United States	102	1,812	17·7
British India	244	998	4·0
China	320	819	
Russia	182	657	2·5
Germany	68	579	3 6
United Kingdom	46	304	8 5
Japan	60	287	6 6
Austria-Hungary	50	271	4·7
France	39 6	263	5·4
Italy	36·5	227	6·2
Brazil	25	150	6 0
Spain	20·5	115	5 6
Belgium	7·5	75	10·0
Netherlands.	6 4	31	4·8

The people of India are not much better off in the consumption other material good, as shown in table below. It is seen that the per capita consumption of the following goods and services in India falls far short of the general mean averages of other countries, varying from ·2 in the case of telephone to 13 in the case of letters and cards.

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1. Adapted. Some Great Commodities, New York, 1923, p. 59 and Agriculture, Washington D C, 1917, p 45.

TABLE—105

Comparative Consumption of Some Material Goods in India. (1)

Commodity	All countries mean aveages	India	
		Absolute number	Index number.
Letters and cards	38	5	13
Telegrams	1·3	·06	4
Telephones	4·2	·01	·2
Ry. passengers	12·8	1·04	10
Raiway freight	6·4	·3	4
Foreign trade	17	1·7	10

5. Conclusion

The statistical records on production in India are not complete enough to warrant any final statement on her productivity. But there exist sufficient data on some of the industries for drawing some conclusions.

The outstanding feature of the productive system of India is its inefficiency, which is shown by the great wastage of resources on the one hand and the lower productivity of the industries on the other. Inspite of the growth of some products in recent years, the productive power of India is quite inadequate to supply the needs of the people including both necessaries and requirements. It is this insufficient production to which is due India's poverty, both absolute and relative The cause of this insufficiency ~~may be~~ traced to one or all the factors of production.

The low productivity could not be a result of the scarcity of land. The major part of the resources is, as we have, seen, wasted at present or remains unexploited for productive purposes.

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(1) Adopted from previous tables.

Capital is quite insufficient in India as compared with that in other countries. That the lack of adequate capital is partly responsible for the present low productivity cannot be denied. But capital, accumulating as it does from the savings of past industries, plays a role less important than the other two factors in the growth of national wealth. The lack of capital could not, therefore, be regarded as the fundamental cause of insufficient production in India. Moreover, there exists a good deal of savings or potential capital which could be collected and utilised for productive purposes by adequate banking and other systems of industrial organisation.

Insufficient production is the result of inefficient labor, i.e., lack of capacity on the part of the people to mobilise the physical, intellectual and moral forces of the country and to organise land and capital effectively for national production. The fundamental cause of India's poverty is, therefore, her industrial inefficiency. (1)

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1. As to the causes of industrial inefficiency in India, see the author's article on the "Background of the Labor Problem," Modern Review, June, 1922. The industrial efficiency of individual workers has received some attention in the author's books on the labor question In "Factory Labor in India," the author refutes the prevalent notion that three factory employes in India are equal to one in Great Britain on the ground that there does not exist the equality of working conditions for such comparison In "Hindustani Workers on the Pacific Coast," the author produces evidence from American and Canadian employers to show that Indian workers in California and British Columbia are as good as Chinese, Japanese, American and Canadian workers.

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INDEX.

Africa, 57.
Agriculture, 64, 94, 95, 162
Alaska, 33, 53.
Alcock, Colonel, 49
Algeria, 35
Apiculture, 75.
Area, 7, 8, 10, 11, 18, 84—90.
Argentine, 18, 20, 21, 29, 37, 76, 77, 85, 89, 92, 93, 121, 122, 127, 153, 169
Australia, 8, 17-21, 29, 38, 57, 75—77, 85, 92, 93, 121, 122, 124, 131, 132, 143, 148, 169, 170.
Austria, 14, 18, 21, 29, 40, 76, 121, 142, 169
Austria-Hungary, 45, 92, 112, 169, 172

Bags, gunny, 116, 118
Bajra, 83.
Bank, 135, co-operative credit, 140-41, postal savings, 138-39
Banking, 135, 137, 167
Barley, 83, 86, 87, 160 162, 163
Bee, 75
Belgium, 13, 14, 18, 21, 29, 34, 55, 98, 112, 121, 122, 143, 148, 153-54, 165
Borneo, 34
Brazil, 8, 35, 37, 57, 86, 92, 121.
Bolivia, 35.
Brewing, 112.
British Isles, 34, 37, 93
Calories, 169-70.
Camels, 73.
Canada, 8, 20, 21, 29, 33-38, 45, 53, 57, 85, 89, 98, 112, 121-22, 124, 131-32, 143 164-65, 169
Capital, 1, 99, 100, 104, 105, 108; 109, 137, 141, 143, 144, 174
Carnegie, 4.
Cart, 78-79
Cattle, 72, 74, 161, 167.
Central Europe, 153.
Ceylon, 91, 125, 148.
China, 9, 33-38, 55, 57, 98, 91-93, 107, 121-26, 131, 148, 153, 154, 165, 171, 172
Chinese Empire, 8
Christian Era, 119
Climate, 6
Cloth, 115, 117, 118
Clothing, 171
Coal, 32-34, 54, 55, 60.
Colombia, 35, 57
Commerce, 144, 154, 155.
Congo, 36
Conclusion, 173
Consumption, 172, 173.
Corea, 84
Cotton, 83, factories 113; gins, 113, 114; goods, 116; industry, 103, 105, 107, 109 mills, 103, 105; presses, 113, 114; production, 83, 86, 94
Cotton, Sir Arthur, 49
Crops, 80-83
Cuba, 40
Cultivation, 80
Czecho-Slovakia, 34, 38, 98 107, 154.

Day, Major Francis, 49.
Death rate, 11.
Denmark, 165.
Density, 14

Deposits, 137, 139, 143, 144.
Donkeys, 73.
Dundee, 108.
Dutch East Indies, 55, 56, 92
East India Company, 96.
East Indies, 35.
Economy, exchange, 14.
Efficiency, 12, 14
Egypt, 35, 56, 57, 86, 164, 165.
Employees, 114.
Energy, 37, 38.
England, 53, 153, 171.
Europe, 35, 116
Factories, see factory.
Factory, 100-03
Fallow, 22-25.
Fauna, 7
Fertility, 64, 65.
Fish, 50, 51, 170
Fisheries, 30, 49.
Fishing, 48, 49, 51-53
Flora, 7
Forests, 25-28, 42-44, 45, 47, 48
Forestry, 41, 42, 44, 48
Formosa, 35, 91.
France, 14, 18, 20, 21, 29, 33, 34, 37, 39, 40, 53, 55, 58, 59, 76, 77, 85, 97, 98, 107, 112, 122, 129, 143, 148, 153, 169, 170, 172.
Food, 163, 169, 170
Galicia, 56.
German Empire, 121, 169.
Germany, 14, 18, 21, 29; 34, 36-38, 40, 53, 55, 58, 59, 75-77, 87, 97, 98, 107, 112, 122, 142, 148, 153, 154, 164, 165, 169, 170, 172
Gins, 114
Goats, 70, 73, 161
Gold, 56, 60, 62, 63.
Golden Crown, 50.
Goods, capital, 116—118, 161.
Gram, 83.
Great Britain, 20, 21, 38, 40, 106, 107, 121, 122.
Great War, 110, 116.
Gupta, Sir K. G., 50, 170.
Handicraft, 96.
Handloom cloth, 115.
Holland, 14, 53, 143
Home charges, 148, 170.
Horses, 70, 73, 161.
Horse power years, 37.
Hungary, 14, 17, 18, 29, 69, 76 121.
Ilk, 50
Implements, 78
Indo-China, 34, 84
Industrialism, 96.
Industries, 41, 105, 107, 109, 113, 114
Inefficiency, 164, 173, 174
Iron, 38-40, 58-60, 62, 63, 110, 111
Italy, 14, 18, 21, 29, 37, 58, 76, 77, 85, 88, 98, 107, 121, 143, 154, 164, 169, 172
Jadeite, 60.
Joint Stock Company, 98—100.
Japan, 13, 14, 18, 20, 21, 29, 30, 33-35, 37, 53, 56-58, 76, 84, 87 91, 92, 98, 103, 107, 112, 121, 124, 126, 129, 131, 132, 143 148, 164, 165, 172.
Java, 34, 91, 148
Jawar, 83.
Jenkins, Dr. J F., 50.
Joint Stock Company, 98-100.
Jute, 83, 160, 162, 163, industry, 108, 109; mills 113, 114; production, 89, 941.

Labor, 2, 174.
Land, 1, 6, 16, 17; arable, 19, 21, 23, 24; forest, 166; productive, 15; scarcity, 173.
Lead, 60.
Linseed, 83, 88, 89, 160, 162.
Livestock, 70—77.
Looms, 104, 106, 107, 109, 110, 161.
Luxemburg, 40, 59.

Maize, 83, 87, 88, 162, 163.
Manganese, 57, 60, 62, 63, 160.
Manufacture, 96, 114, 118.
Merchandise, 152.
Mesopotamia, 35.
Metallargy, 54
Meteorology, 6.
Mexico, 35, 37, 55-57.
Mica, 60
Mills, 73, 105, 109, 114
Mineral, 60, 61, 63.
Mines, 31, 32.
Mining, 54.
Mississippi Valley, 2.
Mustard, 83, 90, 160, 162.

Necessaries, 2
Netherlands, 153, 154, 165
Newfoundland, 40
New Zealand, 18, 93, 165.
Nicholson, Sir, F. A., 50
North America, 30
Norway, 37, 40, 45

Oilseeds, 95.
Outturn, 42—44, 114.
Paper industry, 112
Persia, 35.
Peru, 35, 56.
Petroleum, 34, 35, 56, 60, 62, 63
Philippines, 84, 92.
Pigs, 74.
Pig iron, 79, 122.
Ploughs, 78, 79.
Poland, 34, 38, 87, 98.
Population, 8, 10, 11, 12, 14, 96.
Ponies, 73, 98.
Post office, 127-29, 134.
Poultry, 75.
Poverty, 3.
Production, 58-61, 63, 84-95, 111, 112, 118.
Productivity, 2, 4, 156, 157 159, 160, 162, 163, 165, 173.
Prosperity, 2-5, 7, 14, 153, 156, 168.

Ragi, 83.
Railways, 119, 120, 124, 134, 161
Rainfall, 6.
Rope, 83, 90, 160, 162, 163
Read, Dr. T. T., 37.
Requirements, 2, 3
Resources, 6.
Rice, 83, 84, 94, 160, 162.
Roads, 119.
Rockefeller, 4
Roumania, 55, 56, 87, 88.
Russia, 18, 21, 29, 33-35, 38, 40, 53, 55—58, 75, 76, 85, 87, 89, 92, 93, 97, 107, 123, 124, 128-131, 142, 164, 169, 171, 172.
Russian Empire, 20, 55, 56, 121, 122, 169

Saghalian, 35
Salt, 58, 60, 170
Saltpetre, 60
Serampore, 108
Sesamem, 83
Siberia, 8, 34
Silver, 60
Shipping, 125, 126, 134.
Sheep, 73, 161.

INDEX.

Soviet Union, 8.
Spain, 13, 14, 37, 40, 57—59, 76, 77, 85, 87, 88, 93, 98, 121, 164.
Spindles, 105—10, 161.
South Africa, 93; Union of, 143.
South America, 35.
Standard, Social, 3
Steel, 110, 111.
Strachy, Colonel, 49.
Straits Settlements, 148.
Sugar, 83.
Sumatra, 34, 91.
Sweeden, 37, 40, 45, 53, 59, 112, 165.
Switzerland, 36, 37, 97, 98, 165.
Tata Iron and Steel Company, 40, 110.
Tea, 90, 91, 95, 160
Telegraph, 129—31, 161
Telegrams, 131, 134.
Telephone, 131, 132.
Temperature, 6
Timber, 44—47
Tin, 60.
Tobacco, 91, 92, 160
Trade, 145—47, 49, 150, 153—55, 159.
Traffic, 124.
Transport, 119—34.
Trinidad, 56.
Ukrania, 34.
Universal Postal Union, 143.
United Kingdom, 14, 18, 29, 55, 58, 59, 76, 97, 98, 112, 124, 131, 142, 143, 148, 149, 153, 165, 169, 170, 172.
United States, 8, 19—21, 29, 33—41, 45, 53, 55—59, 75—77, 84—89, 92, 93, 97, 103, 106, 107, 111, 112, 121—26, 128—32, 142, 143, 148, 153, 154, 164, 169—172
Uruguy, 93.
Village papers, 15.
Verseilles Treaty, 39.
Wales, 53, 171
Wastage, 24, 165.
Water power, 36—38.
Waterways, 124.
Wealth, 1, 4
Wheat, 83, 84, 85, 94, 160, 162, 163
Wool, 92, 93.
Woolen manufacture, 110
Works, 144
Yarn, 116—118.
Yield, 84—90.

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